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CONTENTS

OBSERVATIONS ON THE ACTION OF DIGITALIS. WILFRED M. BARTON, M.D., . . . 213

THE LABORATORY DIAGNOSIS OF SYPHILIS. . CHARLES C. W. JUDD, A.B., M.D., . . 220

NEWER METHODS IN GASTRO-INTESTINAL DIAGNOSIS. . . . . ERNEST H. GAITHER, M.D., . . . 229

ON THE REPORTING OF COMMUNICABLE DISEASES. . . . . C. W. G. ROHRER, M.D., ... 234

EDITORIALS. 240

The Quarantine Question. The Present Outbreak of Typhoid Fever in Baltimore.

REPORT OF STATE BOARD OF MEDICAL EXAMINERS OF MARYLAND. 242

MEDICAL ITEMS. . . . . *d*

BOOK REVIEWS. . . . . *e*

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INDEX TO ADVERTISERS

When writing, say you saw advertisement in the MARYLAND MEDICAL JOURNAL.

Angier Chemical Co.....ix
Antiphlogistine (Denver Chem. Co.).xi
Armour & Co.....Front cover
Baker, John C., Co.....vii
Baltimore Medical College.....xxxii
Battle & Co.....x
Betz, Frank S., Co.....vii
Bovinine Co.....2d cover
Breitenbach, M. J., Co.....xv
Crittenton, C. N., Co.....vii
Daniel, John B.....xii
Fairchild Bros. & Foster.....v
Fellows Medical Mfg. Co.....xiv
Fougera, E., & Co.....4th cover
Galen Hall, Atlantic City.....4th cover
Galen Hall, Wernersville, Pa.....xvi
Gardiner Dairy.....xvi
Glen Springs.....ii
Gordshell Chemical Co.....vii
Gundry Sanitarium.....xxx
Gundry Home, Richard.....xxx
Hot Springs Specialist.....vi
Katharmon Chemical Co.....iii
Kress & Owen Co.....xiii
Lambert Pharmacal Co.....i
Lilly, Eli, & Co.....vi
Med. Society Meetings.....iv
Mellin's Food Co.....xx
Mosby, C. V., Book Co.....x
Mulford, H. K., Co.....xxii
Parke, Davis & Co.....3d cover
Peacock Chemical Co.....xv
Phillips, C. H., Chemical Co.....xvii
Platt, Henry B.....xxiii
Postum Cereal Co.....xviii
Purdue Frederick Co.....2d cover
Radium Chemical Co.....viii
Reed & Carnrick.....xix
Relay Sanitarium.....xxx
Resinol Chemical Co.....xxii
River Crest.....xxx
Robins, A. H.....xxxi
Schering & Glatz.....xix
Sharp & Dohme.....xvii
Smith, Martin H., Co.....xvi, xxviii
Storm, Katharine L.....xxxii
Sultan Drug Co.....xxi
Thomas & Thompson Co.....xxxi
Underwood Typewriter Co.....xxix
University of Maryland.....xxxii
Vanadium Chemical Co.....xxi
Wheeler, Dr. T. B.....xxxi
Willms, Chas., Surgical Inst. Co.....xxv

LOCAL DIRECTORY

Chattolanee Spring Water.....xxvi
Fowler Towel Service.....xxvii
Henneman.....xxvii
National Bank of Baltimore.....xxvi
Pikesville Dairy Co.....xxvi
Pollack's.....xxv
Roche, Geo. J., & Son.....xxvi

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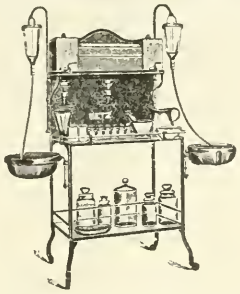

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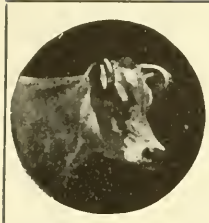

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OBSERVATIONS ON THE ACTION OF DIGITALIS.

By Wilfred M. Barton, M.D.,
Associate Professor of Medicine, Medical Department Georgetown University, Washington, D. C.

Digitalis was introduced into therapeutics by Withering in the latter part of the eighteenth century. It is true that Withering[1] himself was most impressed by the diuretic properties of the drug, but he nevertheless commented upon the beneficial effects of digitalis in cases of heart failure. Before the end of the eighteenth century Ferriar (1799) distinctly emphasized its power to slow the pulse. At the very commencement of the nineteenth century another idea was added to the pulse-slowing conception of digitalis action. Beddoes[2] and Kingslake[3] in 1801 concluded from their investigations, in conformity with those of their predecessors, that digitalis slows the pulse rate, but they brought out the further fact that the strength of the pulse beat is increased. This discovery, however, seems to have made but little impression at the time, and the idea that digitalis acts upon the heart as a sedative became more and more predominant, the principle criterion for this view being, of course, the slowing of the pulse. Corrigan,[4] in 1832 emphasized the power of digitalis to slow the heart, and was so much impressed by this fact that he advised against the use of the drug in aortic regurgitation because of the slowing of the heart and consequent prolongation of the diastolic period.

Bouilland[5] in 1835 commented upon the effects of digitalis, calling it "ce grand moderateur, cette sorte d'opium du coeur" (the great sedative, the opium of the heart), and Pareira,[6] in 1840, must have been a strong believer in the sedative effects of digitalis on the heart, for he recommended it in aneurysm and hemorrhage to reduce the force of circulation.

Twenty-one years later (1871) we find Traube[7] upholding the sedative view, and advancing the theory that the sedative effect of digitalis is due to the stimulation of the vagus center in the medulla.

Thus we see that digitalis, during the century immediately following its introduction into therapeutics, was considered pre-emi-

nently a cardiac sedative, and that feature of its action which attracted the most attention was its power to slow the pulse. The accepted explanation for the slowing, which, indeed, appeared entirely adequate, was vagus stimulation.

Then began a period in which the prevailing conceptions of digitalis action were considerably modified. Indeed, in some respects, it might be said that they were so radically changed as to constitute an almost opposite view.

Schmiedeberg[8] demonstrated in 1874 that, in the frog's heart, digitalis not only slows the rate by vagus stimulation, but that it acts directly upon the cardiac muscle, increasing the force of the contractions. Other investigators, notably Cushny,[9] corroborated these findings, and at the end of the nineteenth century we find the view universally held that the action of digitalis is compounded of vagus stimulation plus a direct action upon the cardiac muscle, the latter consisting of a strengthening of the ventricular contraction and a lessening of ventricular relaxation. It was also found in animal experiments that the vessels in the splanchnic area are constricted through stimulation of the vasomotor center, and perhaps also through a direct action on the vessel wall, the result of which is a rise in the blood pressure. It was reasoned that the net result of these effects must naturally be an increased output of blood from the heart, and that the beneficial results of digitalis in cases of heart failure must, therefore, necessarily be due to a combination of these factors. The dilated heart is contracted, the weakened contractions are reinforced, the coronary circulation is improved; hence the nutrition of the muscle is increased, the slower heart allows a more complete filling of the chambers, the more vigorous contraction insures their more complete discharge. In other words, the findings of experimental pharmacology were carried over into clinical medicine, and the explanation of the good effects of digitalis on heart failure seemed absolutely clear.

It will, therefore, be seen that the work of Schmiedeberg and Cushny—there might also be mentioned others who contributed largely to the subject—tended to develop a conception of digitalis action quite at variance with that which had been previously held. If digitalis increases the force of the muscular contractions, constricts the vessels and raises the blood pressure, it must be regarded not as a sedative, but as a stimulant to the heart. This view became predominant over the sedative view which had ruled over the first century of digitalis use after the days of Withering.

Such, briefly, is the history of the development of ideas upon the action of digitalis up to very recent times.

The views entertained at present concerning the action of digitalis may be said to have largely emerged from those which have been detailed above. So far as the work of the experimental pharmacologist is concerned, the matter seems to be definitely settled. In healthy lower animals, when digitalis is injected into

the circulation, the rate of the beat is slowed, the strength of the ventricular contraction is increased, the ventricular relaxation is diminished, the peripheral vessels are constricted and the blood pressure raised. Although the experiment has never been tried, there is no reason to doubt that in healthy human beings, under the same conditions, the same results would be obtained.

But, obviously, in the therapeutic applications of digitalis these conditions do not obtain. The hearts which are treated by the medical practitioner are affected by a great variety of pathological lesions, and the drug is never introduced in large quantities directly into the circulation.

Obviously, also, the methods which are available in the laboratory for the study of the action of drugs are not available in the clinic, and as most of the clinical investigations upon digitalis have, up to a few years ago, been made without instruments of precision, or without any careful differentiation of the various clinical types of heart disease, it is little wonder that the results were meager and confusing. With the advent of the polygraph and electrocardiograph conditions have changed. From a mass of confusing data and chaotic opinion order and clearness have arisen. Certain clinical types of arrythmia have been definitely classified, and we now speak of auricular fibrillation, premature contractions, sinus arrythmia, heart block, paroxysmal tachycardia, auricular flutter, pulsus alternans as definite semiological types with definite clinical characteristics and reasonably well-known pathological associations. The heart is recognized as a complex organ, made up of histologically differentiated tissue, possessed of not less than five different functions, and capable of originating, feeling, transmitting, actuating and co-ordinating the wonderful species of energy upon which its activity depends.

With the stupendous developments in cardiopathology which have taken place in recent years has also arisen a clearer conception of the action of digitalis in heart disease.

With these developments, both as regards the clinical pathology of the cardiopathies and likewise the application of digitalis to their treatment, the name of Mackenzie[10] will always be associated as pioneer in the minds of English-speaking physicians. To him we owe the creation of auricular fibrillation as a distinct and important clinical type of cardiopathy, though he did not originate the name, but called the condition nodal rhythm in his earlier work. To him, also, we owe the knowledge of the fact that it is in this particular class of cases, namely, auricular fibrillation, that digitalis is so signally effective.

Mackenzie[10] thus expresses the fact: "I have been able to separate from the numerous patients to whom I have given digitalis one group in particular, where the reaction in the heart is so striking as to enable us to recognize the kind of heart in which a beneficial reaction may be expected. It has been known for a long while that digitalis acts upon certain hearts very speedily, causing

great slowing in their rate, and at the same time remarkable improvement in the patient's condition. The class of patients in whom this occurs is limited almost entirely to patients with auricular fibrillation."

Mackenzie also discovered that, so far as the heart's rate is concerned, the reaction to digitalis is less effective when the rhythm is normal; that is to say, when the auricles are not fibrillating. Likewise it soon became appreciated that digitalis has little effect upon the rate of the heart, whether there is auricular fibrillation or not, if the heart is under the influence of intoxications, such as alcohol, or the poisons of acute infectious disease.

It was soon discovered that in patients with the normal rhythm digitalis tends to induce irregularity, notably sinus irregularities, extra systoles, heart block and pulsus alternans.

As experience in the use of digitalis increased it became evident that the drug is of little, if any, service in the treatment of sinus arrythmia, heart block, paroxysmal tachycardia and pulsus alternans. In other words, there is only one kind of cardiac irregularity in which digitalis is effective, and this is auricular fibrillation. To this may possibly be added auricular flutter, a clinical type of arrythmia which has only very recently been discovered.

In auricular fibrillation the effect of digitalis is magical. In scarcely any other disease can the physician point with such confidence to the effect of his remedies. As a result of the intelligent use of digitalis in these cases the moribund may be restored to life and many years of comparative activity added to their existence.

There is little wonder that we should all be interested in this clinical fact, and, so far as our present conception of the action of digitalis from a clinical standpoint is concerned, our chief interest resides in explaining the marvelous effects of the drug in auricular fibrillation, since in other species of arrythmia it is practically useless, if not, under many circumstances, positively harmful, and in cases of decompensation, where the rhythm is normal, the results from digitalis are never so brilliant as in auricular fibrillation.

A small group of cases, however, even of auricular fibrillation, are not affected by digitalis. These are usually persons of advanced years, in whom a considerable degree of cardiosclerosis exists.

Experience has shown that a reaction to digitalis in cases of auricular fibrillation bears some relation to the amount of healthy cardiac tissue present. It is in the young that the most striking results are obtained, whereas in the senile heart which has undergone extensive degeneration digitalis may have little effect or fail altogether.

How, then, shall we explain the slowing of the rate and the beneficial effects which are observed when digitalis is administered in cases of auricular fibrillation?

The most natural assumption would seem to be to regard the

slowing as due to vagus stimulation, and this is the opinion that has been generally held. There is, however, another explanation. The slowing might be due to direct effects upon the muscle.

It was Lewis[11] who first suggested that the real explanation of the pulse slowing by digitalis in cases of auricular fibrillation is a lessening of conductivity of the auriculo-ventricular bundle of His. If this is the true explanation of the slowing, then it is also the true reason for the beneficial effects which accrue from the use of the drug.

Several experimenters have attempted quite recently to solve this problem, among whom may especially be mentioned Cushny and Mackenzie and their coworkers, Lewis, Morris, Silberberg, Price and others.

One method, though an indirect one, of solving the problem, which was early suggested, was to try in cases of auricular fibrillation the effects of drugs which stimulate the vagus center like digitalis, but which are known to have no direct effect on the muscle. Such a pure vagus stimulant is aconite. The drug was tried in a number of cases of fibrillation by Price, but no slowing of the pulse was observed and no beneficial effects were obtained. This is, of course, negative evidence in favor of the supposition that the action of digitalis is not confined to vagus action.

Another method was to try the effects of drugs which act like digitalis on the heart muscle, but which are devoid of vagus action. Cushny selected helleborein for this purpose, but in experiments with the drug upon cases of heart failure it was found that it induced diarrhea before it could be given in sufficient amount to produce any demonstrable effect upon the disease.

These methods of distinguishing whether the therapeutic effects of digitalis are due to inhibition or to muscle action having failed, another method was tried, and this proved more successful. It consisted in removing the inhibitory action of digitalis with atropine, which, as is well known, paralyzes the peripheral terminations of the vagus in the heart and eliminates all impulses through the pneumogastric nerve. If, now, after having removed all inhibitory action, digitalis should still be found to retain its therapeutic effects in auricular fibrillation, then it would be proven that these effects are not dependent upon inhibition, and must, therefore, reside in the muscle action.

In 10 cases of auricular fibrillation Cushny[12], Morris and Silberberg tried this experiment. Atropine was used before the administration of digitalis to determine the amount of vagus tone in each case. Atropine accelerated the pulse before digitalis in all 10 cases, showing that the natural tone of the vagus was good even though the auricles were fibrillating. Digitalis produced slowing and improvement of symptoms in all 10 cases. While the digitalis was being used, atropine was administered and the amount of acceleration noted.

Now, if the action of digitalis in slowing the heart is due to

stimulation of the vagus, and hence to an increase in inhibition tone, then the effect of giving atropine while the heart is under digitalis would be to accelerate it as much as it would be accelerated by atropine before the digitalis was given, because the effect of atropine is only to paralyze inhibition. If, on the contrary, while the heart is slowed by digitalis, the acceleration produced by atropine paralyzing the inhibition is not as great as it is before the digitalis is administered, then it necessarily follows that digitalis is having some other action besides merely stimulating the vagus and increasing the inhibition tone.

In Cushny's experiments the amount of acceleration produced by atropine while the hearts were slowed by digitalis was not as great by any means as it was in the same hearts before the digitalis was administered. A curious effect becomes apparent by a study of these results, namely, that the slow heart under digitalis is not only not controlled by increased tone of the vagus center, but is actually in a state of diminished repression, because, since the amount of control exercised by the inhibitory center may be estimated by the amount of acceleration following its elimination by atropine, then the fact that a less degree of acceleration follows the use of atropine in the heart under digitalis shows that the heart is that much less controlled. The amount of acceleration under atropine may actually be used to estimate the efficacy of digitalis, because the acceleration lessens with the improvement and increases with the failure of improvement.

There is, then, no other possibility than to assume that inhibition is not involved in the therapeutic effects of digitalis in auricular fibrillation, and the real explanation is found in diminution or depression of the irritability of the conducting system, the sino-auricular node, the node of Tawara, the bundle of His in part or in whole. In strong support of this is the fact that if the digitalis is pushed, partial heart block appears, and heart block is due to no other cause than to a depression of the function of conduction. In the frog, auriculo-ventricular block is often seen following the injection of minimum lethal doses of digitalis. In healthy mammals, however, digitalis block is usually inhibitory, though interference of conduction through the bundle has likewise been observed.

As Cushny states, "another explanation of the slowing in clinical cases of auricular fibrillation might be based on the digitalis substances reducing the excitability of the ventricle," but it seems hardly likely that this occurs to any great extent in man, and it seems difficult to reconcile the view with the known fact that, in the lower animals, digitalis increases the force of the ventricular contractions. *Theoretically, we might assume that digitalis simultaneously depresses the bundle of His and stimulates the contractile fibers of the ventricles.*

In non-fibrillating cases of heart failure digitalis likewise reduces the rate of the heart and relieves the symptoms in a certain

proportion of the cases, but the amount of reduction and the number of cases affected is strikingly less than in fibrillating ones.

In cases with the normal rhythm, if the digitalis be pushed, partial heart block or sinus arrythmia are especially likely to develop. In three out of five cases of cardiopathy with normal rhythm Cushny found that the injection of atropine was followed by disappearance of the slowing and irregularity induced by digitalis, and an acceleration of the pulse rate quite equal to that which had obtained before the use of digitalis, and he therefore concludes that in these cases the slowing induced by digitalis was inhibitory in character. In other cases, however, the slowing and block were unchanged by atropine, and must, therefore, have been due to the direct effect of digitalis upon the bundle, as is the case in fibrillation.

The natural inference to be drawn from all these facts is that the inhibitory stimulation produced by digitalis has nothing to do with the beneficial action of the drug in cases of heart failure, and that the benefits derived are due to direct effects of the drug upon the cardiac muscle itself.

SUMMARY.

I. Historically considered, it is interesting to note that the lately-discovered fact that digitalis depresses the conductivity of the bundle of His, thus acting upon the heart by lowering one of the important functions, tends to restore the older view that, essentially considered, digitalis is a sedative much more than a stimulant to the heart.

II. Physiologically considered, that is to say, upon healthy animals under the conditions of laboratory experiments, digitalis slows the heart through vagus stimulation, increases the force of the systole, diminishes the extent of diastole, constricts the vessels and raises the blood pressure. A depression of the healthy bundle has not unequivocally been made out.

III. Clinically considered, it is found that beneficial therapeutic effects from digitalis are found almost exclusively in that particular form of cardiopathy which has received the name of auricular fibrillation. In this condition the effects of digitalis are quite marvelous. In auricular fibrillation the bundle of His may be assumed to be in a condition of pathological excitability and irritability, since normal impulse formation is replaced by impulse formation at multiple auricular foci. The action of digitalis in auricular fibrillation is to depress the function of the bundle of His, and thus to reduce both the formation and the transmission of pathologically formed impulses. Vagus stimulation plays no part in the slowing of the heart, except in non-fibrillating cases. Whether or not the force of ventricular contraction is increased is not known. It is not inconceivable that digitalis may produce a simultaneous depression and stimulation of different parts of the cardiac musculature.

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THE LABORATORY DIAGNOSIS OF SYPHILIS.

By Charles C. W. Judd, A.B., M.D.

Mr. President, Ladies and Gentlemen:

In a disease so protean in its manifestations, so liable to recurrence and so hazardous to pronounce cured in the absence of active symptoms, all of which characterize syphilis, any aid in the establishment of a diagnosis, the rendering of a prognosis or the control of therapy in this condition should form a very tangible part of the practitioner's armamentarium against this disease, martialed by one delegated by him, if not by himself.

It is our purpose to outline very briefly the methods employed in the laboratory for the detection and control of lues and to state in what stage of the disease each has its optimum value.

The microscopic picture of the blood is not, on the whole, very conclusive evidence. There is frequently at the onset of the secondary stage a secondary anaemia, occasionally severe, and perhaps ushered in with alarming rapidity. Indeed, Justice has pointed out that at this stage of the disease the administration of a large dose of mercury so constantly induces a decrease in haemoglobin of from ten per cent. to twenty per cent in a period of from twelve to twenty-four hours that such a therapeutic test may be profitably made for diagnostic purposes. During the sec-

ondary stage of syphilis there is usually a moderate increase in the leucocytes (15,000 to 18,000), the increase affecting the lymphocytes particularly. The most marked changes occur in the congenital luetic.

A far more important and valuable microscopic finding—indeed, the only pathognomonic evidence from either the clinical or laboratory picture—is the detection of the infecting organism, the Spirochaeta (or more properly Treponema) Pallida. Schaudinn found them in primary, secondary and tertiary morbid processes, while Noguchi has just announced that he has identified them in extraordinary numbers in the brains of general paretics, thus proving their association with the final quartinary or parasyphilitic lesions. Etiologically then, the constant association of this organism and the luetic lesion as cause and effect is established, but for diagnostic purposes, the chancre and a few of the secondary erruptions, notably condyloma, mucous patch and pustule, alone offer great prospects to the clinical microscopist. From such a lesion, however, one may usually obtain some bloody serum, which on examination will show the organism. For this examination the ideal method is by means of the so-called dark field illumination. The apparatus consists of a powerful electric arc as a source of light and a specially constructed sub-stage for the compound microscope, which dark field condenser is substituted for the Abbe's condenser. A drop of the serum is placed on a glass slide, a cover-slip superimposed, a drop of immersion oil placed on this and another on the surface of the uppermost lens of the condenser. The preparation is then examined immediately. The slide is placed in position as usual, the sub-stage so centered and adjusted that the drop of oil on its superior lens also comes in contact with the bottom surface of the slide, while that on the cover-slip engages the oil immersion objective. The light of the electric arc is so directed by the reflecting mirror and the sub-stage so adjusted that active Brunonian movement is observed. By this method not only the morphology of the Treponema is determined, but the added diagnostic point, the manner in which it moves may also be seen. The organism is very slender, usually less than 0.5 of a micron, and of varying length, of from 4 to 15 micra. It is tightly twisted like a cork-screw in from 3 to 30 regular curves whose fineness and regularity are important features in differentiating the pallida from other organisms likely to be encountered. Though provided with flagella, the movements of the pallida are only twisting, bending and rotating.

A far simpler, though less satisfactory, method is to dilute a drop of the serum with an equal quantity of good India ink, cover with a cover-slip and examine with the oil immersion lens of the ordinary microscope. The morphology of the organism stands out in this case as a delicate, colorless spiral in marked contrast to the dense blackness which constitutes the remainder of the field.

Though there are other methods of detecting the Treponema obtained from active lesions, the use of the dark field is by far the most efficacious and the India ink method the simplest.

With the organism the testicle of the rabbit may be innoculated with the production of syphilitic orchitis, which on section and stained with silver nitrate according to Levaditi shows the pallida in situ. This has little diagnostic application.

Within the last couple of years Noguchi has succeeded in growing the palida in vitro, an accomplishment which until then had been attended only with failure. Absolute exclusion of air is essential to the growth of this organism, which condition Noguchi satisfied by placing sterile kidney or other tissue, excepting liver, at the bottom of the culture-tubes and layering the top of the medium with liquid petroleum. The medium itself may be either liquid or solid, though initial extra-corporeal growth is better effected on the solid medium, serum agar-agar than the liquid one, serum water.

With this finding as a basis, Noguchi introduced another diagnostic method, the luetin test. A pure culture of Treponema pallida is killed, intimately mixed with the medium in which it is grown and preserved with a weak solution of phenol or tricresol. This constitutes luetin. The reaction is obtained by injecting 0.03 c.c. of this intracutaneously, preferably on the arm. A control of the same materials minus the organism, in equal quantity, is injected at a corresponding site of the opposite side. The injection is best done with a "Sub-Q" syringe graduated in hundredths of a c. c. Separate syringes should be used for luetin and control and should never be utilized for other purposes. The sterility of both injections should be ascertained before administration. It is important that the injection be *intra*-dural, i. e., between the horny layer and the corium, and that it be given under strictly aseptic conditions. The reaction is local and appears usually about the fifth day, but varies from the second to thirtieth. It consists of a painful erythematous, macular, papular, or pustular area (or any combination of these) surrounding the site of injection. The most usual feature is an indurated red papule the size of a dime. Necrosis and even extensive sloughing, however, may occur. The control may give a decided reaction, particularly in tertiary and congenital cases. Otherwise the test reaction should be decidedly more marked than the control. The mild reactions can properly be interpreted only by those widely experienced with the reaction, while faulty technique may quite belie the true result. Properly administered and interpreted, the following conclusions pointed out by Noguchi seem fairly well established with reference to the luetin reaction:

1. It is specific for syphilis.
2. It is usually present in tertiary, latent, treated secondary and congenital lues.

3. It is less constantly so in primary and untreated secondary cases.

4. It is quite inconstant in the parasyphilitic affections.

5. It is, when once positive, little affected by treatment, except in some cases believed to be permanently cured.

Certain dangers (not the least of which is the danger of transmitting syphilis which has occurred at least twice) and the pain connected with the reaction make it inadvisable as a routine measure. Conservative use of the luetin test, however, overrules these objections under two circumstances: In those cases of suspected latent and tertiary lues, where all other evidence is inconclusive; and in those cases which have formerly been positive to the reaction, and, after radical therapy, have completely cleared up, when a second reaction, if negative, speaks favorably for complete eradication of the disease.

By far the most universally applicable laboratory diagnostic method for the detection of syphilis is the Wassermann reaction. Before attempting a comprehensive definition of the reaction itself it is well to get clearly in mind some rather cumbersome terms essential for an understanding of the rational of the test.

Antigens are substances which, when administered to animals, either by infection or inoculation, are capable of inducing a reaction on the part of that animal, with the production of specific antagonistic substances to the material so administered. Various bacterial products, e. g. diphtheria and tetanus toxines, when injected, are antigens, giving rise to specific antitoxines. Certain albuminous substances, blood-serum, milk, some bacterial extracts, etc., are also antigens, their injection being followed by the production of antagonistic substances, which precipitate the specific protein employed in its production, and are hence called precipitins. Certain bacteria themselves are antigens, giving rise to antagonistic substances, which in the presence of their antigenic organism may either dissolve them or cause them to congregate in masses. Such antagonistic substances are known respectively as bacteriolysins and agglutinins. Finally, certain somatic cells, and in particular the red blood cells of a species alien to the animal to which they are administered, induce antagonistic substances to those specific cells. The antagonistic substance so produced is termed amboceptor, one of the two active principles concerned in the biological cytolysis or dissolution of cells. In the Wassermann reaction the cytolysis is concerned only with red blood cells. Haemolysis being the cytolysis of red blood cells, the amboceptor is hence termed an haemolytic amboceptor. For convenience, future reference to amboceptor will imply hemolytic amboceptor. The specificity of amboceptor is, however, so marked that that induced by sheep's blood differs from that induced by dog's or man's. Hence the term anti prefixed to the species whose red blood cell induced the amboceptor is utilized in designating the specific amboceptor, *e. g.*, antisheep amboceptor,

antihuman amboceptor, etc. The rabbit is the most adaptable laboratory animal for the artificial production of amboceptor by the injection of red blood cells of various animals. Amboceptor is fairly stable and not destroyed readily by heat.

All of the specific antagonistic substances produced by the administration of antigens are known as antibodies. These antibodies are quite specific for the antigen which produced them. They may be inherent in the animal's serum, when they are known as natural antibodies, or they may be produced artificially by single or repeated injections of antigens to a suitable animal, as is done in the production of amboceptor. Finally, they may be induced by the accidental infection of an organism by bacteria. In syphilis the treponema or its products, acting as the specific antigen, produce specific antibodies—syphilitic antibodies.

Complement comprises the other active principle concerned in biological cytolysis. Complement, though normally present in all fresh sera, is not identical with that of species alien to that from which it was derived. It gradually disappears spontaneously from the serum on standing, and is completely changed in its character by heating for half an hour at 56° C. The change so effected is termed inactivation. The addition of unchanged complement to inactivated serum is termed reinactivation. The complement of the guinea-pig is unusually adapted to the reinactivation of alien sera, and is the one of choice in the Wassermann reaction. By the fixation of complement one means that complement has so entered into a firmly bound union with an antigen and an antibody that it is unavailable for use in linking together a second antigen and antibody in which complement is essential for a complete reaction between the two.

A hemolytic system consists of complement, amboceptor and a suspension of the latter's antigenic red blood cells, all strengths of these ingredients being in such proportion that equal volumes of each will just satisfy the requirements of complete hemolysis.

With this explanation of terms, let us attempt a definition of the Wassermann reaction before proceeding to the *modus operandi* of conducting it.

The Wassermann reaction is based upon the fact that during a syphilitic infection certain antibodies are usually elaborated by the infected individual and present in his serum, which antibodies in the presence of certain antigenic lipoid substances have the power of fixing complement. This fixation of complement in whole or in part is determined by the addition of an incomplete hemolytic system consisting of red blood cells and their specific amboceptor. In the event of the syphilitic antibody being absent in the first system the unbound complement is then capable of completing the hemolytic system, in which case hemolysis takes place, whereas if the syphilitic antibody in the first system is present, the complement in whole or in part is fixed, and to that degree is incapable of completing the hemolytic system when hemolysis is inhibited

wholly or partially, as the case may be. Hence hemolysis speaks against the presence of syphilitic antibody, and, therefore, syphilitic infection, while inhibition of hemolysis indicates the contrary.

The ingredients for the performance of the test vary somewhat among different workers, but those following are fairly typical.

Complement.—A guinea-pig is bled under anesthesia, the blood cooled, centrifugalized, and the serum first separated from the clot and then diluted to ten times its volume with sterile normal salt solution—the constant diluant for all reagents of the test. Complement should be carefully guarded against exposure to light and elevation of temperature, even those of the room.

Antigen.—An extract of the liver of a syphilitic fetus was formerly used, but the active principle of this was found chemically to be composed mainly of lipoid substances. With this as a basis, non-syphilitic tissue has been utilized for the purpose. Beef heart, being particularly rich in these substances, an alcoholic solution of its acetone insoluble fraction is now being widely used. This is diluted to the proper strength at the time of the test.

Red Blood Cells.—Blood is sterilly collected, usually either from man or the sheep; defibrinated, centrifugalized and washed thoroughly with salt solution to free entirely from the serum, which contains complement or other interfering bodies. The washed corpuscles are used as a weak suspension in sterile salt solution.

Amboceptor.—By the repeated inoculation into a rabbit of either human or sheep erythrocytes the rabbit reacts with the formation of specific hemolytic antihuman or antisheep amboceptor, as the case may be. When these antibodies are in sufficient concentration in the serum of the animal it is killed, the blood collected sterilly and centrifugalized. The serum is placed in small glass beads, which are hermetically sealed; the serum then inactivated by heat, and finally stored away in a cool, dark place until required for a test, when one of the tubes is broken and the serum diluted to the desired strength. Naturally, when using human erythrocytes, antihuman amboceptor must be employed, and for sheep red blood cells antisheep amboceptor is required.

Syphilitic Antibody.—The only ingredient of all reagents unknown may or may not be present in the patient examined. A quantity of blood (2 or 3 c. c. is desirable) is obtained from the patient either by pricking the ear or by venipuncture. The clot is allowed to form and the blood-free serum alone is utilized.

The Wassermann reaction is not merely a qualitative, but a more or less quantitative determination. Hence the various known ingredients must be in predetermined strengths, *i. e.*, of known titre. We employ constantly a uniform dilution of washed blood corpuscles—for example, a 5 per cent. suspension. Likewise we use a constant dilution of complement—1 in 10. We determine upon a constant quantity of each of these substances to be used—say, 0.5 c. c. We must then determine the maximum dilution of amboceptor necessary to effect complete hemolysis

when the volume of the diluted amboceptor is also 0.5 c. c. Let us designate this amount of amboceptor in this dilution as x amboceptor units.

Since within certain limits the quantitative relationship existing between amboceptor and complement is constant, we may say that in the hemolytic system so constructed there are also x complement units, and, furthermore, since all of the cells of the erythrocyte suspension were laked and all of the x amboceptor and complement units were utilized in accomplishing this, there are also x red blood cell units. Such a hemolytic system is said to be complete, while any ingredient less than this (say having but y units) will leave unsatisfied the bonds of (x — y) units of the remaining ingredients, and to that extent the hemolytic system is incomplete.

In the same way that we construct a quantitative hemolytic system we can build up certain other quantitative antigen-complement—antibody systems. For instance, we may use x units of syphilitic antigen (this strength may be obtained by titration), add x units of complement as was done in the hemolytic system, and from a luetics serum add x units of syphilitic antibody. In such a system all of the unsatisfied bonds of the x units of the three ingredients would be mutually satisfied, the system would be complete, all the complement would be fixed. If, however, keeping the antigen and complement constant at x units, and adding but y units of antibody (y being less than x), then but y units of complement would be fixed, leaving (x — y) units of complement free to enter into any other antigen-antibody combination which might be subsequently added.

Insomuch as a syphilitic system so constructed yields no visible reaction, a circuitous method is utilized in determining the degree of complement fixation in it. To a syphilitic system whose completeness with reference to antibody is unknown a complement-free hemolytic system is added as an indicator. The degree of hemolysis resulting (a visible and roughly measurable phenomenon) is an inverse index of the extent of complement fixation that occurred in the syphilitic system. This, in turn, is a direct index of the syphilitic antibody content in the patient's serum.

Obviously, under these conditions, the arbitrarily chosen x used to designate the number of units of these various reagents must be numerically so high that only those with a maximum syphilitic antibody content should possess x units of it in the arbitrarily chosen quantity of serum. On the other hand, y is a variable, ranging from x to 0, and corresponds in all cases to the number of syphilitic antibody units in the tested serum.

The actual performance of the test may be carried out as follows: For each series of tests a known syphilitic and a known non-syphilitic serum is carried through the process as controls. These and the serum of each specimen are inactivated by heating in a water bath at 56° C. for half an hour. In the event of using

an antisheep hemolytic system it is advisable to dilute the inactivated serum with the sheep red blood cell suspension and to incubate the whole for half an hour in a water bath at 37° C. to free the serum from any natural antisheep amboceptor which might be present. Thereafter the diluted serum is centrifugalized and the clear supernatant fluid alone used. In an antihuman system the serum is diluted with salt solution. In either event equal quantities (0.5 c. c. is a convenient volume) of the diluted serum are placed in each of two test-tubes arranged in front and rear rows in a double row test-tube rack. In both tubes place also 0.5 c. c. of diluted complement (each containing x units). To the rear row add 0.5 c. c. of diluted antigen (also containing x units), while to the front row, which is used as a control for peculiarities of the serum, 0.5 c. c. of salt solution (containing 0 units of antigen) is substituted. Both tubes are then incubated in a water bath at 37°C for thirty minutes to facilitate the interaction between antibody (if present) complement and antigen. Following this 0.5 c. c. of the red blood cell suspension (x units) and 0.5 c. c. of diluted amboceptor are added to each tube. In the case of amboceptor 2½ to 3 x units are added. The reason for this is manifold, but chiefly to offset the dilution of complement necessitated by the addition of 0.5 c. c. of both serum and antigen and to counteract any substances in these which may be antagonistic to complement. Furthermore, this gives the patient the benefit of all reasonable doubt on the negative phase of the reaction. The tubes are again incubated in the water-bath at 37°C., this time until the control tube is completely hemolyzed. The result of the reaction is then determined, both test and control being compared with especial reference to the intensity of the red color of the supernatant fluid and the quantity of red cells at the bottom of the tube.

Through the extent of hemolysis is often placed in percentage values, this cannot be done with accuracy. A more feasible method is to rate the results of the test as (-), (±), (∓), (+), (++) and (+++), the grades of hemolysis being complete, nearly complete, a little more than half complete, a little less than half complete, slight, and nil, respectively, in accordance with the degree of complement fixation as y antibody units in the syphilite system increases from 0 to x. Judging by the test alone, for diagnostic purposes (++) and (+++) are definitely indicated of active lues, (—) and (±) definitely against it, (∓) and (+) are doubtful. The validity of such a diagnosis is not ultimate, however, as the clinical aspect is of no little importance. The following suggestions should guide the clinician in his interpretation of the laboratory findings: The significance of a negative reaction in the primary stage is nil. About 80 per cent. of secondary untreated lues yield (+++) reactions, about 15 per cent. (+) or (++), while about 5 per cent. do not develop a positive phase at all. The in-

tensity of the reaction diminishes as treatment becomes effectual and the actute stage subsides. In tertiary lues the percentage of results, contrary to clinical evidence, rises to about 15 per cent., the remainder tending not to show as intense reactions, few yielding a (++++). In latent lues a (++++) is even less often obtained, a (+) is diagnostic, and even a (±) is suggestive. In general paresis most yield a (++++), while in tabes this drops to 50 per cent. to 60 per cent.

When the clinical evidence and the Wassermann are not in accord, the test should be repeated at three-month intervals for a year, if necessary. The decrease in the degree of complement fixation, as determined by repeated Wassermann reactions at about three-month intervals, is of inestimable value in the control of therapy. A single negative reaction is, however, not sufficient evidence to warrant discontinuance of treatment, though the absence of all clinical evidence of the disease and repeated negative Wassermann's at three-month intervals for a year does justify the withdrawal of treatment, though not necessarily the ultimate cure of the disease. A luetin test in this instance may throw much light upon that mooted point.

It should be borne in mind that untreated lues, or lues without treatment for a considerable period, though the Wassermann is negative, may, upon the administration of anti-luetic treatment, and for a variable time thereafter, yield a positive Wassermann. This phenomenon is known as a provocative Wassermann reaction.

A final word upon the behavior of the cerebro-spinal fluid in syphilis of the central nervous system, including tabes and general paresis. In these conditions the number of white cells, usually small lymphocytes, is materially increased, to as high as 150, instead of three or four. The protein content, particularly the globulin, is likewise increased, even in excess of that due to the cellular augmentation. Finally, the Wassermann test, using the spinal fluid instead of the blood serum, usually yields a positive reaction in an active process, even though the test with the blood was negative.

In conclusion, the blood picture, the detection of the treponema pallida, the production of luetic lesions in animals with this organism, its cultivation in vitro, the luetin and Wassermann reactions, and the tests with the spinal fluid in lues of the brain and cord, afford a laboratory array of diagnostic and prognostic measures which the clinician can ill afford not to employ in this class of cases.

1902 Eastern Avenue.

NEWER METHODS IN GASTRO-INTESTINAL DIAGNOSIS.

By Dr. Ernest H. Gaither.

In recent years many new diagnostic methods in different fields of medicine have been described—some of true value, others of indifferent caliber, while still others have not withstood the test of experience. In company with these wonderful strides, methods of diagnostic value, with especial reference to the gastro-intestinal tract, have made their appearance until at present we are very fortunate in possessing truly valuable adjuncts to our previous knowledge concerning this important branch of internal medicine.

It obviously would be an impossible task to endeavor in the short space of time allotted to attempt to bring to your attention even in the most superficial manner all or nearly all of the laboratory methods available, so will be content to direct your attention in a very brief manner to what seems to be the most important of the newer methods in gastro-intestinal diagnosis, with a few exceptions, treating the matter wholly from a laboratory point of view.

Two methods have been lately brought forward for the determination of the motoric power of the stomach—one, "The Water Soluble Chloraphyl Test," by Boas; the other, "The Starch Retention Test," by T. Hausmann.

The procedure in the former is carried out as follows: To 400 c. c. of water 20 drops of water soluble chlorophyl are added, and this taken on an empty stomach. The fluid is aspirated from the stomach in half hour, at which time under normal conditions 50 to 60 c. c. of green colored fluid should be found. If more, then motor insufficiency should be assumed. Mucus or saliva should not be swallowed while the water is in the stomach on account of the liability of the chlorophyl to collect upon it.

The reasons advanced for using water as a means of motoric power determination are that it does not stimulate gastric secretion and thus has no reflex action on the pylorus; the balance remaining in the stomach after a given interval is readily determined and there is no sedimentation to interfere with the findings. Boas also claims this test to be a convenient method in order to show whether or not conditions are improving under treatment.

"The Starch Retention Test," by T. Hausmann. This author admits that the finding of currants twelve hours after the test supper indicates a motor insufficiency of the stomach, but contends that this disturbance may be due to a mechanical interference or atony of the stomach walls, whereas the discovery of microscopical particles of starch speaks certainly for obstruction of a mechanical nature. This statement is made, he says, only after a

very extensive experience during 10 years of close observation. The test is carried out as follows:

Twelve hours after a test supper of boiled rice (small plateful) the fasting stomach is aspirated, the contents are set aside, preferably in a sedimentation glass, for about five minutes. The supernatant fluid is then poured off and a few drops of Lugol's solution or preferably tincture iodine are added, and then thoroughly mixed with the residue; now dilute with water until the mixture is transparent. If rice particles are present, they will appear as dark blue granules throughout the fluid, floating on top or gravitating to the bottom. Hausmann also states that the discovery of starch by microscopical means only speaks merely for an atonic condition, and has never encountered a case of macroscopical retention which proved to be atony alone.

Another point emphasized is that currants are not always recovered when the stomach contents are aspirated, even when present, and, therefore, that method is not as trustworthy as the one just described. His patients are aspirated in the prone position. Experience with both tests points to the greater reliability and accuracy of the Hausmann starch retention test, which has been used rutinely in the gastro-intestinal division of the Johns Hopkins dispensary for the past six months on a large number of patients, and thus far bears out the observations of Hausmann in every particular. This method is simpler in its performance, and much more convenient for the patient; for in this test aspiration is practiced but once, while in the chlorophyl method aspiration is made use of twice—before and after the intake of the colored solution; then, again, it seems that the reliability of the latter test might to a certain extent be interfered with by the possibility of some remaining fluid in the stomach, which would serve to change the color of the fluid. It must also be remembered that the coloring matter collects on all mucus or saliva that is swallowed, thus again interfering with the color reaction. So, for these reasons, it seems that the Hausmann test is more reliable and much to be preferred to that of Boas.

Pancreas.—Of late much interest has been manifested as regards investigations looking toward the diagnosis of pancreatic diseases of which much is unknown, but at present we possess methods which give promise of being great aids in this hitherto unsatisfactory field. The ones which seem capable of bearing out our assertions are T. R. Brown's modifications of Wohlgemuth's methods for diastase estimation in urine and feces and the casein test for trypsin by Fuld.

The estimation of diastase in urine is as follows:

A twenty-four-hour specimen of urine under toluol is diluted to a certain point, and this placed in a series of test tubes in gradually diminishing amounts, after which solutions of normal salt and soluble starch are added; then placed in water bath 37.5° to 38° c. for 30 minutes, removed, water added and decinormal iodine

solution added. A note is made of first change between blue, showing undigested starch, and red, showing erythrodextrin starch digestion.

Determination of diastase in feces: An enema night before if necessary. At 8 A. M. slice of bread, glass of milk; 8.30 and 9 A. M., salts given; save stool until 1 P. M. and weigh. Dilute stool; put in gradually diminishing amounts in a series of test tubes mixed with normal salt, after which soluble starch solution is added. After one-half hour in bath at 37.5° to 38°, remove and add decinormal iodine solution. Same reaction noted as in urine test.

Trypsin Test.—Stool diluted; thoroughly mixed with salt solution and placed in test tubes in gradually diminishing amounts. A solution of casein, decinormal sodium hydroxide and aqua are added to each tube. Place in bath at 37.5° to 38° for half hour; remove and add a few drops of a solution of glacial acetic acid, alcohol and water.

In the presence of tryptic digestion no reaction is noted. A whitish precipitate shows absence of trypsin.

As to the practical application of these tests, one seems justified in saying that the diastase test for feces and the casein trypsin test are much more reliable and accurate than the diastatic estimation of the urine. It appears that this latter point might be made clear when we stop to consider the many factors and conditions which play important roles before the diastate is eliminated in the kidney secretion.

The elimination of the pancreatic secretion by way of the intestinal canal is, of course, much simpler and more direct and less liable to the complicated chemical and metabolic influences, which we believe invalidate to a certain extent the importance of diastatic determination in the urine. The results obtained in estimating the functional or organic affections of the pancreas, from observance of the diastase and trypsin in the feces, has thus far been very illuminating and quite accurate.

GASTRIC CARCINOMA.

As to laboratory methods made use of and brought forward of late for the detection of carcinoma, one has only to glance at the formidable array as adduced by various authors in order to discern our great weakness and inability in this direction. However, we should not be deterred in our efforts to solve the problem of an early diagnosis in this perplexing and terrible scourge. The test to which your attention is directed at this time is the Wolff-Junghann soluble albumen test. The test follows:

Filtered gastric contents placed in six test tubes in gradually diminishing amounts and distilled water added until the dilutions range from 1:10 to 1:400. Reverse tubes once or twice and float a solution of phosphotungstic acid, hydrochloric acid, alcohol and distilled water upon the fluid in each tube. A white albuminous ring up to and including the 1:100 dilution speaks neither for nor

against carcinoma; below this point is negative, above is positive.

One requisite of this test is that the gastric contents must contain no free hydrochloric.

This test is based on the assumption that in carcinomatous gastric contents there is an increase of soluble albuminous material, probably due to one of three factors:

(1) That there is a ferment secreted by the cancer cells capable of breaking the proteids down to a further and much simpler point than the normal gastric juice.

(2) Possibly some interference with resorption.

(3) There may be an albuminous secretion from the cancer cells themselves, the so-called "cancer milk."

From personal experience both here and abroad this test is worthy of recommendation and trial because of its simplicity and reliability. After many experiments with it in different varieties of malignant and non-malignant achylias, only once has the finding been contrary to proven clinical conclusions. This was a case of carcinoma at the junction of the esophagus with the cardia; otherwise, cases of a malignant character have been positive, those of a benign nature negative.

TESTS FOR GLANDULAR SECRETION.

Two excellent tests for the estimation of gastric glandular activity are the Edestin test for pepsin, by Fuld, and Sjoquist's method for the qualitative estimation of combined hydrochloric.

Edestin Test.—Filtered gastric contents, thoroughly mixed with a solution of hydrochloric acid having an acidity of 30, are placed in test tubes in diminishing amounts. Then a solution of Edestin made with a solution of hydrochloric acid having an acidity of 30 is added to each tube. After a half-hour bath at 37.5° to 38° c., 1 to 2 c. c. of a saturated sodium chloride solution are added; a white precipitate shows absence of pepsin; no precipitate shows pepsin to be present.

Sjoquist's Test.—Ten c. c. of filtered gastric contents placed in crucible, barium carbonate added, reduced to ash, when warm distilled water is added and filtered to clarify. A few drops of a dilute solution of $H_2 SO_4$ added. A precipitate shows the presence of combined hydrochloric acid; no precipitate, an absence. The practical value of these tests is the helpfulness in establishing the presence or absence of true grandular affection, especially in cases of achylia, where we are endeavoring to prove the existence or non-existence of an organic disease of the glands themselves. These tests serve to round out and illuminate the clinical picture and objective findings in true organic or functional disturbances.

Liver Functional Tests.—Of late the liver functional tests have engrossed the attention of internists more than previously, and a great deal of work has been done along this line. The first to be described is the aldehyde test, which has for its purpose the

determination of the presence or absence of urobilinogen in the urine. The reagent used is as follows:

℞ Paradimethylaminobenzaldehyde, gm. 4.
Hydrochloric acid, gm. 4.
Water and a few drops of alcohol to 200 c. c.

To 5 c. c. of urine a few drops of the above reagent is added. When in the presence of urobilinogen a rose-red color appears at once or in a few minutes, exceptionally though the reaction may be delayed as long as a few hours before the maximum intensity of the color is reached. An excellent method for bringing out the reaction is the addition of a few c. c. of chloroform to the urine reagent mixture, which carries the red color to the bottom of the tube, making a very pretty contrast. Chase gives two reasons for the appearance of urobilinogen in the urine:

(1) Impaired liver cells which have failed to stop or transform the urobilinogen coming to them through the portal vein from the bowels, and which allows its entrance into the general circulation.

(2) Congestive circulatory influences by which the urobilinogen laden blood normally passing through the liver is deflected into the collateral circulation of the portal system as through the hemorrhoidal veins to the iliac veins in constipation or to the general circulation through a caput medusae in advanced cirrhosis.

It is known that—1. Normal liver cells never let an appreciable quantity of urobilinogen pass into the blood of the general circulation. 2. A very slight loss of normal liver function even in a part of the liver is followed by the appearance of a pathological amount of urobilinogen in the urine.

A positive test does not necessarily speak for a grave diseased condition of the liver, but simply points to a deficiency in the functional capacity of the liver cells. Inasmuch as slight positive reactions appear in constipated conditions, it is always advisable to precede the test with a purge. Very often a pinkish tinge is noted, but the test is only positive in the presence of a rose-red color.

Galactose Test.—Bauer of Vienna first called attention to this test, which is performed as follows:

Forty gm. of galactose are given in tea on an empty stomach in the morning, after free purgation the night before. The urine is examined by Fehling's method four hours after the intake of the galactose, when under normal conditions no sugar should be present. Where diseased liver conditions are present the elimination is quite large until the sixth hour, and may even be detected up to the tenth to fourteenth hour after the administration of the galactose. Allowances should, of course, be made where gastric conditions are present which would interfere with the propulsion of the stomach contents into the intestine.

The urobilinogen test is one used to detect localized diseased conditions of the liver cells, while the galactose test is one used to discover general pathological conditions of the organ. The latter test is recommended as being especially useful in the diagnosis of

alcoholic cirrhosis; also in septic conditions of infectious diseases with liver complications.

Personal experience with these tests and information gained from others thus far has been disappointing and unyielding in shedding much light upon liver conditions, both local and general. In view of the complex and varied processes through which any substance must pass before being eliminated by the liver, it does not appear that these methods promise a great deal in proving to be truly helpful in the great majority of liver affections.

Occult Blood.—The last test to be brought to your attention is the tolidin or orthotolidin test as described by Ruttan and Hardisty for the detection of occult blood. Tolidin or orthotolidin is a crystalline basic body, closely allied to toluidin and benzidin. It is used to detect blood in a watery solution. These authors claim it to be more satisfactory than benzidin on account of its greater delicacy, its more lasting color and the fact that it can be made into a solution that retains its power of reaction for three or four weeks; also that in the presence of very minute quantities of blood the reaction increases gradually in intensity and persists longer than with the other reagents, the color lasting several hours. The method is as follows: Pea-sized piece of feces, mixed thoroughly with about 5 c. c. water; boil in order to destroy oxidizing ferments. Add from 10 to 15 drops of a glacial acetic acid solution of tolidin (1 to 25) to a few c. c. of hydrogen peroxide. Add several drops of the feces solution to the peroxide-tolidin mixture and a green color appears in the presence of blood.

For the same reasons as advanced by the authors of this test and enumerated above, personal experience with this method proves it to be extremely reliable. The fact that it does not have to be made fresh each time it is used, and can be kept for three to four weeks; that it is used to detect blood in a watery solution instead of an ethereal extract, also that the color reaction lasts for a much greater length of time, stamps it as a most desirable method to use.

The Latrobe, Charles and Read streets.

ON THE REPORTING OF COMMUNICABLE DISEASES.

By C. W. G. Rohrer, M.D.,
Maryland State Department of Health.

(Continued from August Number.)

PRINCE GEORGE'S COUNTY.

Area in square miles, 479.6.
Population, 36,147.

Dr. John E. Sansbury, County Health Officer.
Dr. W. F. Taylor, Health Officer of Laurel.
Dr. J. C. Ohlendorf, Health Officer of Mount Rainier.

The infectious disease returns from Prince George's county are classified as "good," totaling 185 for the year 1912.

COMMUNICABLE DISEASE CASES REPORTED IN PRINCE GEORGE COUNTY, YEAR OF 1912.

Name of Disease.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Typhoid fever	5	1	3	..	..	..	1	10	9	2	4	..	35
Scarlet fever	..	3	3	1	1	..	4	..	..	1	5	2	20
Diphtheria	2	3	1	4	4	1	1	..	5	2	6	2	31
Whooping cough	..	..	10	15	18	12	..	1	..	..	..	..	56
Measles	..	1	2	3	..	6	..	..	..	..	..	..	12
Chicken-pox	..	1	..	..	..	1	..	..	..	..	..	1	3
Mumps	1	1	3	5	2	4	..	1	..	..	..	..	20
Influenza	4	..	..	..	..	..	..	..	..	..	..	..	4
German measles	..	..	..	..	..	..	..	..	..	..	..	..	..
Smallpox	..	..	..	..	..	..	..	..	..	..	..	..	..
Malaria	..	..	..	..	..	..	..	..	..	..	..	..	..
Meningitis	..	..	..	..	..	..	..	..	..	..	..	..	..
Erysipelas	..	..	..	..	..	..	..	..	2	..	..	..	2
Anterior poliomyelitis	..	..	..	..	..	..	..	2	..	..	..	..	2
Septicemia	..	..	..	..	..	..	..	..	..	..	..	..	..
Acute dysentery	..	..	..	..	..	..	..	..	..	..	..	..	..
Total	15	10	22	28	25	24	6	14	16	5	15	5	185

QUEEN ANNE'S COUNTY.

Area in square miles, 363.4.
Population, 16,839.

Dr. A. E. Landers, County Health Officer.

The infectious disease returns from Queen Anne's county are classified as "bad," totaling but 69 for the year 1912.

COMMUNICABLE DISEASE CASES REPORTED IN QUEEN ANNE'S COUNTY, YEAR OF 1912.

Name of Disease.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Typhoid fever	..	..	..	1	..	..	..	2	12	7	12	3	37
Scarlet fever	..	1	..	..	..	..	1	1	..	..	2	..	5
Diphtheria	2	1	1	..	..	..	..	..	..	..	13	4	21
Whooping cough	..	..	..	..	..	2	..	..	..	..	..	..	2
Measles	..	..	..	..	..	..	..	..	..	..	..	..	..
Chicken-pox	..	..	..	..	..	..	..	..	..	..	..	..	..
Mumps	..	..	..	3	..	..	..	..	..	..	1	..	4
Influenza	..	..	..	..	..	..	..	..	..	..	..	..	..
German measles	..	..	..	..	..	..	..	..	..	..	..	..	..
Smallpox	..	..	..	..	..	..	..	..	..	..	..	..	..
Malaria	..	..	..	..	..	..	..	..	..	..	..	..	..
Meningitis	..	..	..	..	..	..	..	..	..	..	..	..	..
Erysipelas	..	..	..	..	..	..	..	..	..	..	..	..	..
Anterior poliomyelitis	..	..	..	..	..	..	..	..	..	..	..	..	..
Septicemia	..	..	..	..	..	..	..	..	..	..	..	..	..
Acute dysentery	..	..	..	..	..	..	..	..	..	..	..	..	..
Total	2	2	1	4	..	2	1	3	12	7	28	7	69

Somerset County.

Area in square miles, 328.6.
Population, 26,455.

Dr. T. Jacob Smith, County Health Officer.
Dr. C. E. Collins, Health Officer of Crisfield.

The infectious disease returns from Somerset county are classified as "good," totaling 127 for the year 1912.

COMMUNICABLE DISEASE CASES REPORTED IN SOMERSET COUNTY, YEAR OF 1912.

Name of Disease.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Typhoid fever	5	..	..	..	..	4	17	17	4	16	15	3	81
Scarlet fever	10	..	1	..	..	..	..	..	..	4	1	..	16
Diphtheria	1	..	..	..	3	..	..	..	1	2	..	4	11
Whooping cough	2	..	..	5	..	2	..	..	..	..	2	..	11
Measles	..	..	..	..	..	..	..	..	..	..	..	..	..
Chicken-pox	1	3	..	..	..	..	..	..	..	..	1	2	7
Mumps	..	..	..	..	..	..	..	..	..	..	..	..	..
Influenza	..	..	..	..	..	..	..	..	..	..	..	..	..
German measles	..	..	..	..	..	..	..	..	..	..	..	..	..
Smallpox	..	..	..	..	..	..	..	..	..	..	..	..	..
Malaria	..	..	..	..	..	..	..	..	..	..	..	..	..
Meningitis	..	..	..	..	..	..	..	..	..	..	..	1	1
Erysipelas	..	..	..	..	..	..	..	..	..	..	..	..	..
Anterior poliomyelitis	..	..	..	..	..	..	..	..	..	..	..	..	..
Septicemia	..	..	..	..	..	..	..	..	..	..	..	..	..
Acute dysentery	..	..	..	..	..	..	..	..	..	..	..	..	..
Total	19	3	1	5	3	6	17	17	5	22	19	10	127

St. Mary's County.

Area in square miles, 369.1.
Population, 17,030.

Dr. F. F. Greenwell, County Health Officer.

The infectious disease returns from St. Mary's county are classified as "very bad," totaling but 13 for the entire year of 1912.

COMMUNICABLE DISEASE CASES REPORTED IN ST. MARY'S COUNTY, YEAR OF 1912.

Name of Disease.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Typhoid fever	..	..	..	..	..	..	..	..	..	..	..	..	..
Scarlet fever	..	..	..	..	..	..	..	..	..	..	2	11	13
Diphtheria	..	..	..	..	..	..	..	..	..	..	..	..	..
Whooping cough	..	..	..	..	..	..	..	..	..	..	..	..	..
Measles	..	..	..	..	..	..	..	..	..	..	..	..	..
Chicken-pox	..	..	..	..	..	..	..	..	..	..	..	..	..
Mumps	..	..	..	..	..	..	..	..	..	..	..	..	..
Influenza	..	..	..	..	..	..	..	..	..	..	..	..	..
German measles	..	..	..	..	..	..	..	..	..	..	..	..	..
Smallpox	..	..	..	..	..	..	..	..	..	..	..	..	..
Malaria	..	..	..	..	..	..	..	..	..	..	..	..	..
Meningitis	..	..	..	..	..	..	..	..	..	..	..	..	..
Erysipelas	..	..	..	..	..	..	..	..	..	..	..	..	..
Anterior poliomyelitis	..	..	..	..	..	..	..	..	..	..	..	..	..
Septicemia	..	..	..	..	..	..	..	..	..	..	..	..	..
Acute dysentery	..	..	..	..	..	..	..	..	..	..	..	..	..
Pellagra	..	..	..	..	..	..	..	..	..	..	..	..	..
Total	..	..	..	..	..	..	..	..	..	..	2	11	13

TALBOT COUNTY.

Area in square miles, 267.1.
Population, 19,620.

Dr. E. R. Trippe, County Health Officer.
Dr. J. B. Merritt, Health Officer of Easton.

The infectious disease returns from Talbot county are classified as "bad," totaling but 78 for the year 1912.

COMMUNICABLE DISEASE CASES REPORTED IN TALBOT COUNTY. YEAR OF 1912.

Name of Disease.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Typhoid fever	2	..	1	..	..	..	..	12	5	12	..	10	42
Scarlet fever	..	..	1	..	..	..	..	..	..	1	..	..	2
Diphtheria	4	4	..	..	..	..	..	..	2	11	4	..	25
Whooping cough	3	..	..	..	..	..	..	..	..	..	..	4	7
Measles	..	..	..	..	..	..	..	..	..	..	..	..	..
Chicken-pox	..	1	..	..	..	..	..	..	..	..	..	1	2
Mumps	..	..	..	..	..	..	..	..	..	..	..	..	..
Influenza	..	..	..	..	..	..	..	..	..	..	..	..	..
German measles	..	..	..	..	..	..	..	..	..	..	..	..	..
Smallpox	..	..	..	..	..	..	..	..	..	..	..	..	..
Malaria	..	..	..	..	..	..	..	..	..	..	..	..	..
Meningitis	..	..	..	..	..	..	..	..	..	..	..	..	..
Erysipelas	..	..	..	..	..	..	..	..	..	..	..	..	..
Anterior poliomyelitis	..	..	..	..	..	..	..	..	..	..	..	..	..
Septicemia	..	..	..	..	..	..	..	..	..	..	..	..	..
Acute dysentery	..	..	..	..	..	..	..	..	..	..	..	..	..
Total	9	5	2	..	..	..	..	12	7	24	4	15	78

WASHINGTON COUNTY.

Area in square miles, 457.3.
Population, 49,567.

Dr. W. D. Campbell, County Health Officer.
Dr. H. E. Tabler, Health Officer of Hancock.

The infectious disease returns from Washington county are classified, along with Allegany county, as "very good," totaling 807 for the year 1912. These are the only two counties in the entire State of Maryland which are entitled to this classification. I feel like taking off my hat to Dr. J. E. Pitsnogle, the retired health officer, because he is the Moses that led the people of Washington county through the wilderness of chaotic public health conditions into the promised land of efficient and well-organized methods of sanitation. He is a man of good, sound, practical ideas and sufficient energy and backbone to mold them into action.

Dr. Campbell, the present incumbent, has proven himself to be a most excellent official, and is largely upholding Dr. Pitsnogle's traditions.

The infectious disease returns from Hancock are not what they ought to be.

COMMUNICABLE DISEASE CASES REPORTED IN WASHINGTON COUNTY, YEAR OF 1912.

Name of Disease.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Typhoid fever	2	1	..	1	4	2	4	6	17	25	9	19	90
Scarlet fever	4	7	4	4	1	..	3	5	5	18	18	18	87
Diphtheria	7	10	7	9	6	6	1	6	11	15	23	19	120
Whooping-cough	1	..	1	2	..	6	..	..	..	..	..	..	10
Measles	11	90	117	100	65	15	1	1	..	2	29	21	452
Chicken-pox	4	5	2	6	..	..	1	..	..	5	14	6	43
Mumps	..	..	..	1	..	..	..	..	..	..	..	..	1
Influenza	..	..	..	..	..	..	..	..	..	..	..	..	..
German measles	..	..	..	..	..	..	..	..	..	..	..	..	..
Smallpox	..	..	..	..	..	..	..	..	..	..	..	..	..
Malaria	..	..	..	..	..	..	..	..	1	..	..	..	1
Meningitis	..	..	..	..	..	..	..	..	..	..	..	..	..
Erysipelas	..	..	1	..	..	1	..	..	..	..	..	..	2
Anterior poliomyelitis	..	..	..	..	..	..	..	..	..	..	..	..	..
Septicemia	..	..	..	..	..	..	..	..	1	..	..	..	1
Acute dysentery	..	..	..	..	..	..	..	..	..	..	..	..	..
Total	29	113	132	123	76	30	10	18	35	65	93	83	807

Wicomico County.

Area in square miles, 368.9.
Population, 26,815.

Dr. Charles R. Truitt, County Health Officer.

The infectious disease returns from Wicomico county are classified, along with Charles, Garrett and St. Mary's, as "very bad," totaling but 44 for the entire year of 1912.

COMMUNICABLE DISEASE CASES REPORTED IN WICOMICO COUNTY, YEAR OF 1912.

Name of Disease.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Typhoid fever	..	..	..	..	1	..	23	..	3	8	..	..	35
Scarlet fever	..	..	..	..	..	..	..	..	..	1	..	..	1
Diphtheria	..	..	1	..	..	..	..	1	..	4	..	..	6
Whooping cough	..	..	..	..	..	..	..	1	..	1	..	..	2
Measles	..	..	..	..	..	..	..	..	..	..	..	..	..
Chicken-pox	..	..	..	..	..	..	..	..	..	..	..	..	..
Mumps	..	..	..	..	..	..	..	..	..	..	..	..	..
Influenza	..	..	..	..	..	..	..	..	..	..	..	..	..
German measles	..	..	..	..	..	..	..	..	..	..	..	..	..
Smallpox	..	..	..	..	..	..	..	..	..	..	..	..	..
Malaria	..	..	..	..	..	..	..	..	..	..	..	..	..
Meningitis	..	..	..	..	..	..	..	..	..	..	..	..	..
Erysipelas	..	..	..	..	..	..	..	..	..	..	..	..	..
Anterior poliomyelitis	..	..	..	..	..	..	..	..	..	..	..	..	..
Septicemia	..	..	..	..	..	..	..	..	..	..	..	..	..
Acute dysentery	..	..	..	..	..	..	..	..	..	..	..	..	..
Pellagra	..	..	..	..	..	..	..	..	..	..	..	..	..
Total	..	..	1	..	1	..	23	2	3	14	..	..	44

Worcester County.

Area in square miles, 491.5.
Population, 21,841.

Dr. Paul Jones, County Health Officer.
Dr. R. Lee Hall, Health Officer of Pocomoke City.

The infectious disease returns from Worcester county are classified as "good," totaling 108 for the year 1912.

COMMUNICABLE DISEASE CASES REPORTED IN WORCESTER COUNTY, YEAR OF 1912.

Name of Disease.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Typhoid fever	1	3	..	1	..	..	11	7	13	10	..	3	51
Scarlet fever	4	1	12	..	..	..	..	..	1	..	..	..	20
Diphtheria	4	4	..	1	..	1	..	..	3	..	..	1	14
Whooping cough	..	..	..	..	..	..	..	..	..	..	..	2	2
Measles	..	..	..	..	3	..	..	..	..	..	..	..	3
Chicken-pox	..	..	..	..	..	..	..	..	..	..	..	..	..
Mumps	3	4	1	2	..	3	..	..	..	..	..	..	13
Influenza	2	..	..	..	..	..	..	..	..	..	..	..	2
German measles	..	..	..	..	..	..	..	..	..	..	..	..	..
Smallpox	..	..	..	..	..	..	..	..	..	..	..	..	..
Malaria	..	..	..	..	..	..	..	1	..	..	..	..	1
Meningitis	..	..	..	..	..	..	..	..	..	..	..	..	..
Erysipelas	1	..	..	..	..	..	..	..	..	..	..	..	1
Anterior poliomyelitis	..	..	..	..	..	..	..	..	..	..	..	..	..
Septicemia	..	..	..	..	..	..	..	..	..	..	..	..	..
Acute dysentery	..	..	..	..	..	..	..	1	..	..	..	..	1
Total	15	12	13	4	7	4	11	9	17	10	..	6	108

The following table will give a condensed summary of the status of the 23 counties of Maryland in regard to the reporting of communicable diseases:

STATUS OF THE COUNTIES OF MARYLAND, COMMUNICABLE DISEASE REPORTS, 1912.

Comparative rank.	Name of County.	No. of cases reported.	Classification.
1st	Allegany county	1567	"Very good."
2d	Baltimore county	961	"Good."
3d	Washington county	867	"Very good."
4th	Frederick county	364	"Good."
5th	Carroll county	277	"Good."
6th	Anne Arundel county	222	"Good."
7th	Dorchester county	186	"Good."
8th	Prince George's county	185	"Good."
9th	Montgomery county	144	"Good."
10th	Somerset county	127	"Good."
11th	Howard county	110	"Good."
12th	Worcester county	108	"Good."
13th	Cecil county	98	"Good."
14th	Talbot county	78	"Bad."
15th	Caroline county	76	"Bad."
16th	Kent county	74	"Bad."
17th	Harford county	74	"Bad."
18th	Calvert county	71	"Bad."
19th	Queen Anne's county	69	"Bad."
20th	Charles county	47	"Very bad."
21st	Wicomico county	44	"Very bad."
22d	Garrett county	23	"Very bad."
23d	St. Mary's county	13	"Very bad."

(To be continued in October.)

MARYLAND MEDICAL JOURNAL

NATHAN WINSLOW, M.D., *Editor.*

Associate Editors:

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RICHARD H. JOHNSTON, M.D. | A. SAMUELS, M.D.

BALTIMORE, SEPTEMBER, 1913

THE QUARANTINE QUESTION.

THE transfer of the Baltimore Quarantine Station to the Federal Government has now been under discussion for several months. Much progress has been made in this movement despite the fact of opposition from certain quarters. All the arguments in favor of a national quarantine service at this port are plain, common-sense arguments.

Following the discussion of this question before the Baltimore City Medical Society, the Board of Directors of the Chamber of Commerce passed resolutions opposing the transfer, on the grounds that such action would prove injurious to the best maritime interests of the port. While we do not doubt the sincerity of this belief, we do fail to see that it is a logical argument in favor of the retention of the station by the city.

The medical fraternity of the city is practically unanimously in favor of Government ownership of the quarantine, and a number of organizations have gone on record as favoring the transfer to the Federal authorities, chief among these being the City-Wide Congress, the Park Approach Protective Association, and recently the Merchants and Manufacturers' Association came out strongly in favor of the transfer.

At the present writing the shipping interests of the port have so far relented from their first opposition, which was made manifest through the declaration of the Chamber of Commerce, as to now favor this action, provided the ports of Boston and New York will agree to make the same changes in their service at the same time. This is a move in the right direction, but whether it will be possible to carry out this proposition remains to be seen. Both New York and Boston are, as far as the public is concerned, in favor of Government ownership of their quarantine stations, but the same selfish reasons for municipal retention are claimed in those cities as exist in Baltimore.

Some one of the three aforesaid cities, whose quarantine stations have not yet come under Federal control, must first make the move in this matter, and why not Baltimore.

As is admitted on all sides it is but a matter of time until the quarantine stations of all the ports in this country will be in the hands of the Government. And why should Baltimore not be the first to make the move, rather than to wait until she may be forced, in the face of some threatened crisis, to take such action?

THE PRESENT OUTBREAK OF TYPHOID FEVER IN BALTIMORE.

For some unusual reason the city of Baltimore is this summer in the throes of a severe typhoid epidemic. Since the method of conveyance of this disease is thoroughly understood, this should not be. Formerly typhoid was thought to be entirely water-borne, but it is now recognized that the fly is a very effective agent in the transmissal of the affection. With the exception of those accidentally infected while handling typhoid patients, the above-mentioned avenues are the principal paths in the spread of the malady. Watered milk or infected food occasionally serve as the infecting agent. What lesson has been taught by the above facts? It is that typhoid fever is an unnecessary affliction, as both its method of conveyance and its cause are thoroughly known. Typhoid germs cannot withstand heat, therefore, if the water be boiled, the possibility of being taken down with this affliction is materially lessened, and still more so if flies are kept away from typhoid contaminated ejecta. Filtration of the water supply of cities has also played its role in the reduction of enteric fever. As Baltimore has no filtration plant, her citizens, if they wish to avoid the possibility of contracting typhoid, must resort to the aforementioned preventive measures. These, however, are troublesome, consequently likely to be neglected. This being so, science has given to the world a practical method of preventing typhoid. When the technic is perfect, it is absolutely devoid of dangers. We know that occasionally disagreeable symptoms occur as the result of its administration, but these are only temporary. We are speaking of immunization by the injection of the so-called typhoid vaccine. The fate of the American Army during the Spanish-American War is known, likewise that of the maneuver camp at Galveston, the one ravaged by typhoid, the other free. Physicians, advise your patients to take the vaccine before it is too late.

REPORT OF BOARD OF MEDICAL EXAMINERS OF MARYLAND.

QUESTIONS AT THE JUNE (1913) EXAMINATIONS.

CHEMISTRY.

1. Distinguish between "chemical" and "physical" changes in matter and give an example of each.

2. (a) Define an acid. (b) Give formula of one inorganic acid and show how this formula fulfills the conditions stated in your definition. (c) Give the name and formula of one organic acid.

3. (a) Should a physician order iodide of potash and corrosive sublimate in the same solution, what chemical and physical changes would take place in the mixture? (b) Would the resulting products be harmful to the patient and, if so, which?

4. Complete the following equations:

$$Mn\ O_2 + H_2\ S\ O_4 =$$
$$3\ H_2O + P_2O_5 =$$
$$C_2H_5OH + H_2SO_4 =$$
$$2\ KI + F\ O_2 =$$

5. Write the graphic formula of Marsh Gas and (b) illustrate by graphic formulæ its relation to wood alcohol.

6. (a) What are carbohydrates? (b) Name three substances belonging to this group.

7. (a) Iodine—Give its (1) valence; (2) method of preparation; (3) test for iodine. (b) Give name and formula of one of its organic and one of its inorganic compounds.

8. How would you know that a given white powder was calomel and not ordinary bismuth?

9. Upon what chemical fact does Fehling's test for sugar depend?

10. (a) Give the most important constituents of normal gastric juice. (b) What is the action of normal gastric juice upon:

(1) Proteids
(2) Fats
(3) Carbohydrates

} in the ordinary course of digestion?

ANATOMY.

1. Describe upper extremity of humerus, including attachments of muscles.

2. Name cavities of the heart and describe the valves.

3. Name salivary glands and locate orifice of their ducts.

4. Give foramen of exit from cranium, distribution and function of the pneumogastric nerve.

5. Name muscles of the eyeball and eyelids, and give their nerve supply.

6. Through what vessels does blood pass in going from the external saphenous vein to right index finger?

7. Name muscles on back of leg.

8. Describe the pharynx.

9. Describe gross anatomy of the liver.

10. Describe the thyroid body.

THERAPEUTICS.

1. Explain the action of diphtheria and tetanus antitoxin as prophylactic and curative agents.

2. Write a prescription in Latin, without abbreviation, containing three ingredients which you would use in the treatment of acute pharyngitis.

3. Write a prescription in Latin, without abbreviation, containing four liquid ingredients; state conditions for which it is intended and give directions for its use.

4. Name three official preparations of ammonium and give their therapy.

5. Hyoscyamus: Its active principle, physiological action and therapy.

6. Belladonna: Its active principle, physiological action and therapy.

7. Digitalis: Its active principle, physiological action and therapy.

8. Give an example of a prescription showing a chemical incompatibility and describe the incompatibility.

9. Give the physiological action of nitroglycerine and indications for its use.

10. Name the chlorides of hydrargyrum, therapy, symptoms and treatment of poisons.

MATERIA MEDICA.

1. Bismuth, beta-naphthol, camphor and aspirin. The official preparations and dose of each.

2. Give source of sugar of milk, urotropin, phenol, pepsin and glycerine.

3. Name the alkaloids of nux vomica.

4. Belladonna. The official preparations and doses.

5. Cocain, codein, colchicum, colocynth. The official preparations and doses.

6. Define extracts: Give five official extracts, with average dose of each.

7. Name three drugs which may produce a rash and describe such rash.

8. Write a prescription for 36 pills, for an adult, containing iron, quinine, strychnine and arsenic.

9. Name three external and three internal antiseptics and give strength in which they are generally used.

10. What are antitoxins? Name three. Give average dose and how administered.

IN PLACE OF OTHER ALKALIES USE

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For Correcting Hyperacid Conditions—Local or Systemic. Vehicle for Salicylates, Iodides, Balsams, Etc.

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With Marked Beneficial Action Upon the Nervous System. To Be Relied Upon Where a Deficiency of the Phosphates is Evident.

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PHYSIOLOGY.

1. Give reaction of the following and state cause of reaction: Gastric juice, blood, urine and pancreatic juice.
2. Describe briefly the physical and morphologic changes of the leukocytes.
3. What are carbohydrates and what part do they play in the general metabolism?
4. Describe briefly the physiology of the clotting of blood.
5. Define anabolism, osmosis, dialysis and rigor mortis.
6. State some of the conditions which produce variations from the normal temperature of the body.
7. State briefly what is meant by the vasomotor nervous system.
8. Describe the fetal circulation. What changes in the circulation take place at birth? What is the physical condition of the child if such changes do not take place properly?
9. Describe the physiology of menstruation.
10. What is meant by secretions? What is the difference between external and internal secretions? Give examples of each.

PATHOLOGY.

1. Describe trichina spiralis, giving life cycle, and morbid anatomy of trichiniasis.
2. Mention two or more conditions that prevent the passage of urine from the male bladder, and describe the process which causes one of these conditions?
3. Mention six varieties of calculi and describe the formation and composition of one variety?
4. What are the signs of death? Sketch the method of doing a complete autopsy.
5. Give the pathological changes occurring in acute bronchitis
6. Mention the lesions of typhoid fever? What is a typhoid carrier and how recognized? How is anti-typhoid vaccine prepared?
7. Describe the healing of an uninfected wound.
8. Give the characteristics of a malignant growth. Mention at least four varieties which affect the breast and describe one.
9. Discuss anaphylaxis.
10. Describe the morbid process occurring in a tuberculous hip which is untreated, resulting from bony anchylosis.

PRACTICE.

1. Define: (a) Ulcerative stomatitis. What remedy is specific for this disease? (b) Argyle-Robinson pupil. In what disease does it occur? (c) Arthritis deformans. (d) Anuria, hematuria, polyuria. (e) Phlebitis. Mention a disease in which it occurs as a late complication.
2. Define: (a) Nephrolithiasis and cholelithiasis. (b) Landry's paralysis. (c) Name the various valvular diseases of the heart. (d) Enteroptosis. (e) Dysphagia. Name some diseases in which it occurs.
3. Diagnosis—Define: (a) Tonic and clonic spasms. (b) Hemoptysis and hematemesis. (c) Sibilant and sonorous rales. (d) What is Tic Douloureux and how would you treat it?
4. What are the physical signs of pulmonary solidification and pleuritic effusion?
5. Differentiate: Follicular tonsillitis and diphtheria.
6. Name the day of eruption in smallpox, chickenpox, measles and scarlet-fever.
7. Give diagnosis of intestinal obstruction and name three types.
8. Treatment: Give treatment of nephritis and name both types.
9. Being called to a case of pulmonary tuberculosis in its early stages, what symptoms would you find, and what measures would you employ?
10. Pellagra. What are its symptoms and how would you treat them?

SURGERY.

1. Give symptoms and treatment of chronic purulent otitis media.
2. Name conditions which may cause inability to pass urine, with symptoms of each.
3. Give symptoms, diagnosis and treatment of Pott's disease in the dorsal region.
4. Symptomatology and treatment of acute glaucoma.
5. Give symptoms and treatment of a fracture of a rib. What complications may arise.
6. Give symptoms, diagnosis and treatment of cholelithiasis.
7. Give symptoms and signs of thoracic aneurysm.
8. Define surgical shock: give symptoms, signs and treatment.
9. A patient having received a severe blow over left temporal region, is unconscious for a time, paralysis coming on late. Discuss the possibilities.
10. Give symptoms, diagnosis and treatment of carcinoma of the rectum.

OBSTETRICS.

1. Describe the changes that take place in the organs of the mother during normal pregnancy.
2. Give the classification of contracted pelvis.
3. Describe the sutures, fontanelles and protuberances of the presenting fetal head.
4. What is kyphosis and its influence on labor?
5. Give the diagnosis of tubal pregnancy before rupture.
6. Mention the different methods of dilitation of the cervical canal for delivery of the fetus.
7. Give the indications for version.
8. What are the dangers in forceps delivery?
9. Describe the physiological lochia.
10. Describe briefly the operation—trachelorrhaphy.

Nourishment—
Minimum Waste

There are disease-conditions wherein loss of tissue (and its attendant impairment of vital energy) makes it imperative that speedy and efficient nourishment be supplied, in order that the metabolic balance may be turned in favor of the patient.

The logical and ideal means of bringing about such an issue is food, which, while supplying the needed nourishment, is particularly easily digestible and contains a minimum of waste material to be separated from true nourishment by the already weakened digestive organs.

Grape-Nuts

and cream, in such proportion as the attending physician finds indicated to supply the element of fat, seems fully to meet the above ideal requirements, as has been attested by thousands of physicians for a decade or more.

Made of selected whole wheat and malted barley, Grape-Nuts contains all the food materials of these nutritious cereals—including the phosphates usually lacking in ordinary bread made from white flour.

The processes of manufacturing this famous food insure perfect baking and full sterilization. The starches are broken down and in large measure converted into dextrin and dextrose (soluble carbohydrates) for easy and prompt assimilation.

There is little waste in Grape-Nuts—the food being absorbed generally in about ONE HOUR after ingestion. The firm, crisp granules entail deliberate mastication, and the results are reliable, as has been established for many years.

Samples sent on request, to any physician who is desirous of making original or confirmative experiments.

Also the *Clinical Record*, for physician's bedside use, will be mailed to those who have not already received it.

POSTUM CEREAL COMPANY, Limited, BATTLE CREEK, MICHIGAN, U. S. A.

Summary of Results of Examination Held by the Board of Medical Examiners of Maryland, June 17, 18, 19 and 20, 1913.

No.	College of Graduation.	Anatomy.	Surgery.	Pathology.	Obstetrics.	Practice.	Chemistry.	Materia Medica.	Therapeutics.	Physiology.	Total.	Average.
1	University of Maryland, '11	75	..	79	..	75	..	..	91	..	...	..
2	Women's Medical of Penna., '10	75	75	79	..	75	..	..	..	..	...	..
3	University of Vienna, '06	77	75	77	75	75	99	75	90	80	723	80
*4	Maryland Medical, '12	63	50	00	76	55	75	75	67	45	506	56
5	Johns Hopkins, '11	78	89	97	91	93	83	75	86	84	776	86
6	Baltimore Medical, '12	75	..	75	..	75	..	..	..	..	...	..
7	Johns Hopkins	90	..	..	..	..	97	86	..	88	...	..
8	Johns Hopkins	81	..	..	..	..	100	66	..	78	...	..
9	University of Pennsylvania, '11	93	90	100	79	93	85	86	83	84	793	88
10	Johns Hopkins	79	..	..	..	..	95	57	..	77	...	..
11	University of Maryland, '11	77	75	75	70	69	68	63	67	75	639	71
12	McGill University, '08	90	85	97	89	86	99	91	96	96	829	92
13	Johns Hopkins	75	..	..	..	..	84	42	..	63	...	..
14	University of Maryland, '12	84	75	71	78	75	96	75	86	75	715	79
15	Maryland Medical, '12	59	71	..	..	..	68	..	..	..	...	..
16	Johns Hopkins, '06	75	76	89	90	79	85	58	93	75	720	80
17	University of Maryland, '13	72	74	83	92	70	75	75	85	76	702	78
18	University of Maryland, '11	55	60	61	77	75	53	54	57	52	544	69
19	University of Maryland, '13	84	76	93	90	82	87	76	87	75	750	83
20	Johns Hopkins	93	..	..	..	..	100	67	..	75	...	..
21	Johns Hopkins	68	..	..	..	..	96	34	..	54	...	..
22	Johns Hopkins, '13	85	75	100	95	86	85	95	91	100	812	90
23	Johns Hopkins, '13	85	83	95	92	80	96	75	92	83	781	87
24	Johns Hopkins, '13	92	79	94	92	91	95	90	91	87	811	90
25	Johns Hopkins, '13	84	80	99	90	85	92	65	94	76	765	85
26	Johns Hopkins, '13	79	77	99	92	82	90	75	84	75	753	84
27	University of Maryland, '12	73	67	95	80	63	72	69	78	68	665	74
28	University of Maryland, '13	70	77	94	96	75	96	63	100	63	734	81
29	University of Maryland, '13	83	76	90	89	75	84	77	92	75	741	82
30	College of Physicians and Surg., Balto., '13	96	80	84	75	87	98	94	90	92	796	88
31	University of Maryland, '13	91	82	94	89	88	81	79	94	93	791	88
32	Maryland Medical, '12	75	44	..	52	66	75	76	69	..	...	..
33	Maryland Medical, '12	65	..	..	..	69	75	65	..	65	...	..
34	Maryland Medical, '12	77	..	..	..	..	..	..	..	..	...	..
35	Maryland Medical, '12	..	..	..	..	..	61	54	75	63	...	..
36	University of Maryland, '13	78	70	78	87	75	75	75	75	69	682	76
37	Jefferson Medical, '02	65	67	64	..	..	43	75	..	62	...	..
38	Maryland Medical, '12	66	44	50	75	..	78	75	84	63	535	..
39	Johns Hopkins, '13	75	81	87	92	84	88	59	87	75	728	81
40	Georgetown University	94	..	..	..	..	84	75	..	83	...	..
41	University of Maryland, '13	96	77	95	88	75	87	77	94	96	785	87
42	Johns Hopkins, '13	63	80	93	92	79	98	64	62	81	712	79
43	Johns Hopkins	82	..	..	..	..	85	75	..	75	...	..
44	University of Maryland, '13	90	80	93	94	81	90	65	88	88	769	85
*45	Baltimore Medical, '13	77	68	00	83	59	80	75	79	60	581	64
46	Johns Hopkins, '13	92	80	95	88	86	94	76	88	77	776	86
47	Johns Hopkins, '13	89	79	90	92	80	96	59	88	78	751	83
48	University of Maryland, '13	81	73	84	80	76	75	75	67	75	686	76
49	Jefferson Medical, '13	98	91	59	93	90	89	78	84	84	766	85
50	University of Maryland, '12	81	..	79	..	..	80	..	..	78	...	..
51	Johns Hopkins, '13	85	79	94	86	81	90	83	86	77	761	85
52	University of Pennsylvania, '13	91	92	94	94	87	88	86	88	88	808	90
53	Johns Hopkins, '13	79	80	91	94	80	80	86	87	77	757	84
54	Maryland Medical, '09	..	..	..	..	..	67	..	..	..	...	..
55	Johns Hopkins, '13	83	75	99	89	80	95	76	79	64	740	82
56	University of Maryland, '13	78	66	49	75	64	78	63	76	73	622	69
57	Johns Hopkins, '13	94	76	99	92	82	95	86	82	84	790	88
58	Maryland Medical, '12	75	..	..	..	..	..	75	75	75	...	..
59	University of Maryland, '13	47	73	85	84	65	69	77	84	75	659	73
60	Johns Hopkins	69	..	..	..	..	95	53	..	75	...	..
61	Maryland Medical, '11	75	56	57	79	67	63	66	90	62	615	68
62	Jefferson Medical, '12	87	81	79	91	83	94	92	92	80	779	86
63	Johns Hopkins, '13	96	79	84	93	83	82	64	81	77	739	82
64	George Washington University, '13	95	78	82	87	80	82	75	80	80	739	82
65	Jefferson Medical, '13	85	75	84	94	64	83	75	83	75	718	80
66	University of Berlin, '05	92	79	79	92	64	97	64	66	66	699	78
67	George Washington University, '12	80	75	84	91	79	95	89	82	82	757	84
68	University of Maryland	79	..	..	..	..	89	79	..	81	...	..
69	Maryland Medical, '11	77	75	..	..	76	..	..	85	75	...	..
70	Baltimore Medical, '13	85	74	84	81	91	94	88	89	82	768	85
71	Baltimore Medical, '13	Failed to appear.										
72	George Washington University, '11	82	78	96	89	82	88	48	77	64	704	78
73	Johns Hopkins, '13	Failed to appear.										

*In numbers 4 and 45 the correction (00) means that examination was made in these branches, but no per cent. was obtained.

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Summary of Results of Examination Held by the Board of Medical Examiners of Maryland, June 17, 18, 19 and 20, 1913.—(*Continued.*)

No.	College of Graduation.	Anatomy	Surgery	Pathology	Obstetrics	Practice	Chemistry	Materia Medica	Therapeutics	Physiology	Total	Average
74	Jefferson Medical, '13	88	82	92	84	87	82	87	82	80	764	85
75	Woman's Medical, '13	75	96	100	89	81	89	75	94	58	757	84
76	Baltimore Medical, '13	75	72	83	93	79	99	75	80	82	738	82
77	Johns Hopkins, '12	88	83	92	80	86	83	86	90	86	774	86
78	Johns Hopkins, '13	93	78	97	83	79	95	75	79	81	760	84
79	Johns Hopkins, '13	80	80	100	94	80	96	83	97	85	795	88
80	Johns Hopkins, '13	74	95	98	79	85	95	58	69	75	728	81
81	Johns Hopkins, '13	93	79	94	90	85	97	79	72	82	771	86
82	Johns Hopkins, '13	86	80	99	93	84	98	82	79	77	778	86
83	University of Maryland, '13	64	78	79	97	75	60	75	71	76	675	75
84	Johns Hopkins	90	..	..	..	..	96	87	..	75	...	..
85	Johns Hopkins	95	..	..	..	..	97	43	..	80	...	..
86	Johns Hopkins	93	..	..	..	..	100	75	..	77	...	..
87	Johns Hopkins	89	..	..	..	..	96	75	..	75	...	..
88	University of Maryland	76	..	..	..	..	82	85	..	75	...	..
89	University of Maryland	75	..	..	..	..	97	94	..	84	...	..
90	University of Maryland	92	..	..	..	..	99	93	..	83	...	..
91	Johns Hopkins, '13	94	76	97	79	89	95	80	90	94	794	88
92	University of Maryland	85	..	..	..	..	97	80	..	78	...	..
93	University of Maryland	90	..	..	..	..	97	89	..	83	...	..
94	University of Maryland	80	..	..	..	..	86	84	..	80	...	..
95	College of Physicians and Surg., Balto., '13	75	82	94	91	84	80	75	93	75	749	83
96	University of Maryland, '13	71	76	82	91	62	89	60	76	59	666	74
97	University of Maryland	76	..	..	..	..	94	77	..	75	...	..
98	University of Maryland	73	..	..	..	..	77	75	..	67	...	..
99	University of Maryland	79	..	..	..	..	75	81	..	80	...	..
100	University of Maryland	91	..	..	..	..	100	76	..	83	...	..
101	Johns Hopkins, '13	85	86	99	95	88	87	87	90	75	792	88
102	University of Maryland	94	..	..	..	..	91	79	..	75	...	..
103	University of Maryland, '13	84	82	81	93	75	75	88	96	82	756	84
104	Johns Hopkins, '13	88	80	93	91	80	89	83	91	80	775	86
105	University of Maryland, '12	97	77	82	75	66	95	75	61	84	712	79
106	University of Maryland	80	..	..	..	..	89	62	..	64	...	..
107	University of Maryland, '13	73	80	88	94	75	60	80	71	63	684	76
108	Johns Hopkins	92	..	..	..	..	98	83	..	86	...	..
109	Johns Hopkins	85	..	..	..	..	90	53	..	80	...	..
110	Johns Hopkins, '13	59	63	79	92	75	52	75	54	75	624	69
111	University of Maryland	80	..	..	..	..	90	90	..	84	...	..
112	Medico-Chirurgical, Phila., '12	79	85	85	..	75	..	76	..	75	...	..
113	University of Maryland	83	..	..	..	..	95	89	..	75	...	..
114	University of Maryland, '13	93	91	89	80	75	88	75	87	89	767	85
115	Woman's Medical of Penna., '13	80	89	81	91	90	96	82	82	78	769	85
116	Medical College of Virginia, '13	67	76	79	77	68	75	80	64	65	651	72
117	Meharry Medical, '13	57	59	57	66	57	70	59	58	50	533	59
118	Medico-Chirurgical, Phila., '13	94	76	82	91	83	78	81	75	80	740	82
119	Johns Hopkins, '13	82	79	88	90	84	97	89	76	86	771	86
120	Maryland Medical, '12	40	71	52	70	60	50	64	82	42	531	59
121	University of Maryland	96	..	..	..	..	95	89	..	90	...	..
122	Johns Hopkins, '13	93	87	99	78	88	100	75	88	75	783	87
123	University of Maryland	90	..	..	..	..	77	78	..	81	...	..
124	College of Physicians and Surg., Balto., '13	75	74	81	70	64	93	76	77	66	675	75
125	University of Maryland	94	..	..	..	..	99	93	..	75	...	..
126	Ohio Eclectic, '12	71	53	67	83	70	69	38	75	50	576	64
127	Meharry Medical, '13	67	66	67	69	79	75	60	69	55	607	67
128	Woman's Medical, Phila., '12	88	77	95	92	75	98	75	86	82	768	85
129	University of Maryland	74	..	..	..	..	84	79	..	80	...	..
130	College of Physicians and Surg., Balto., '13	74	78	81	94	75	84	67	83	83	719	80
131	College of Physicians and Surg., Balto., '13	80	76	79	80	67	60	58	84	66	650	72
132	University of Maryland, '13	90	79	82	89	80	88	67	81	94	750	83
133	Medical College of Virginia, '13	76	75	69	88	70	75	64	87	71	675	75
134	Temple University, '13	56	76	72	90	85	60	64	65	75	643	71
135	College Physicians and Surg., Boston, '11	41	70	54	75	57	60	78	77	66	578	64
136	University of Maryland, '13	87	76	88	93	82	84	83	85	80	758	84
137	Maryland Medical, '12	75	75	..	..	..	..	75	..	75	...	..

In the above summary an average of 75 is required of those participating in the examination for the first time in order to secure a license. Those who have failed are eligible to re-examination at the expiration of six months. They are then obliged to receive a rating of 75 in each branch in which they are re-examined before license can be issued. Under the Maryland laws, students who, at the end of their second year, have successfully passed their college examination in Anatomy, Chemistry, Materia Medica and Physiology, are entitled to examination by the Board of Medical Examiners in these branches. The ratings made by these students in the examination known as the "second-year examination" are carried forward and made part of the final examination, when an average of 75 must be obtained to secure a license. We trust that this statement will make clear the apparently incomplete examination of certain participants.

Diarrhea of Infants

Mellin's Food, 4 level tablespoonfuls
Water (boiled, then cooled) 16 ounces

Analysis of above mixture:

Proteins (cereal)	.56
Carbohydrates (no starch)	4.33
Salts	.23
Water	94.88
	100.00

Calories per fluidounce = 6.2

Maltose and Dextrin
Furnishes ample body-heat and energy
Spares the body-proteins
Maltose—most assimilable of all sugars
Maltose—least fermentable of all sugars

Give one to three ounces every hour or two, according to the age of the baby, continuing until stools lessen in number and improve in character.

Milk, preferably skimmed, may then be substituted for water — one ounce each day—until regular proportions of milk and water, adapted to the age of the baby are reached.

The use of this diet in diarrhea is a rational procedure and is in accord with present teachings.

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Medical Items.

THE faculty of the Johns Hopkins University gave a reception July 4 in McCoy Hall to the students of the summer school.

THE twenty-third annual session of the New York and New England Association of Railway Surgeons will be held at the Hotel Astor, New York city, on Wednesday, October 22, 1913. A very interesting and attractive program has been arranged. Dr. Hugh H. Young of Baltimore will deliver the "Address in Surgery." Railway surgeons, attorneys and officials and all members of the medical profession are cordially invited to attend.

THE following is a list of those who successfully passed the Maryland State Board Medical Examination, held in Baltimore, June 17-20, 1913, and to whom licenses were granted to register as physicians and surgeons:

Arthur W. Allen, Frank R. Bailey, Philip J. Bean, Charles F. W. Bove, Earle G. Breeding, Harold M. Brown, Humphrey W. Butler, Francis F. Callahan, Noland M. Canter, Henry W. Cave, Leon M. Cavanaugh, Howard L. Cecil, Helen D. Clarke, John W. V. Clifft, George W. Corner, Edwin D. Davis, Frederick L. Detrick, George W. Disbrow, Richard C. Dodson, John B. Donovan, Frank J. Edgett, Charles R. Edwards, Cortlandt W. Elkin, Ernest C. Fishbaugh, Linton Gerdine, Carol Goldenthal, Amos W. Gottschall, Claude D. Hamilton, Leonard Hays, Nathan J. Helfgott, Edward G. Henry, Josiah B. Henneberger, Isaac P. Heymann, Walter R. Holmes, Jr., Lee Howard, Edgar E. Hume, Jr., Isaac B. Hunt, Grace Huse, James L. Jenson, Charles C. W. Judd, Richard F. Kieffer, Howard E. Lecates, Dorothea Lee, Bertrand A. Lillich, Marie Millikin, Arthur H. Morse, Franklin D. Murphy, Elmer Newcomer, Merle C. Newkirk, Walter A. Ostendorf, Grover F. Powers, Raymond J. Quinn, Ernest H. Rahn, William D. Reddish, R. Wayne Richards, Maurice L. Richardson, Iva E. Rowland, Albanus S. Ryland, Raymond H. Ryder, Charles E. Sandoz, Augusta R. Scott, Henry N. Shaw, William F. Shorts, Alex. A. Sienkiewicz, Frederick J. Smith, Gardiner Spring, Jr., James E. Stowers, Charles B. Thompson, Martillus H. Todd, William H. Toulson, Edgar E. Travers, Anna J. Waite, Benjamin F. Weems, Edwin V. Whitaker, Karl M. Wilson and Timothy G. Williams.

MARRIAGES.

ARTHUR BOND CECIL, M.D., Johns Hopkins Medical School, class of 1909, of Millersville, Md., to Miss Mary Wrightson Caulk of Easton, Md., at Baltimore, July 24, 1913. Dr. and Mrs. Cecil will reside in Los Angeles, Cal., where Dr. Cecil will be connected with the Los Angeles University.

DEATHS.

THEODORE SAULSBURY, M.D., Physicians and Surgeons, '73, of Burrsville, Md., died at the Delaware State Hospital, Farnhurst, July 24, 1913, aged 65 years. Dr. Saulsbury represented Caroline county in the Legislature in the session of 1908.

JAMES P. CARTER, M.D., University of Maryland, '52, of Gerrardstown, W. Va., died at his home August 2, 1913, aged 87 years.

JOHN FRANCIS GRAHAM, M.D., Baltimore Medical College, '96, died at his home in Marion, Ind., recently, aged 62 years.

JOSEPH C. WUNDER, M.D., University of Maryland, '89, of Baltimore, Md., died of tuberculosis at the State Sanatorium at Sabillasville, July 20, 1913, aged 47 years. Dr. Wunder was the first to introduce diphtheria antitoxin in Baltimore.

PRIDE JONES THOMAS, M.D., University of Maryland, '02, of Wilmington, N. C., died at his home of valvular heart disease, June 24, 1913, aged 38 years.

ISIDORE CLARENCE SMULYAN, M.D., Baltimore Medical College, '01, of Salt Lake City, Utah, died in the Holy Cross Hospital, Salt Lake City, from nephritis, June 30, 1913, aged 35 years.

JOSEPH MORTON BUNTING, M.D., Baltimore Medical College, '09, of Kingston, N. Y., died recently at his home, aged 28 years.

JAMES HENRY MURRAY, M.D., Maryland Medical College, '12, of West River, Md., died at St. Luke's Hospital, Jacksonville, Fla., from intestinal obstruction, July 24, 1913, aged 24 years.

MONTE GRIFFITH, M.D., University of Maryland, '96, of Washington, D. C., died at his home in Cherrydale, Va., of angina pectoris, July 11, 1913, aged 51 years.

JOHN G. HUCK, M.D., Physicians and Surgeons, '82, of Baltimore, Md., died at the Johns Hopkins Hospital from heart trouble, August 13, 1913, aged 63 years.

A. S. HOTALING, M.D., Physicians and Surgeons, '94, of Syracuse, N. Y., died at his home from appendicitis, August 8, 1913, aged 40 years.

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is its muscular power impaired, and its secretory activity notably diminished

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and one to two teaspoonfuls before meals will not only stimulate local glandular secretion but will substantially aid in re-establishing the physiologic activity of the whole alimentary canal.

IS THE HEART FLAGGING,

is it losing its power and becoming irregular and weak

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and one every hour or two will quickly correct arrhythmia, impart tone to the heart muscle and restore efficiency to the whole cardiac mechanism.

ARE THE BOWELS SLUGGISH

and overloaded and the whole system depressed and deranged by the retention of toxic waste material

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Prunoids are Required

and one to three at bedtime will afford prompt relief—without the usual cathartic discomfort—and rapidly restore functional regularity of the bowels.

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Book Reviews.

DIET LISTS OF THE PRESBYTERIAN HOSPITAL, NEW YORK CITY. Compiled, with notes, by Herbert S. Carter, A.M., M.D., Consulting Physician to the Lincoln Hospital; Associate in Medicine at Columbia University and Assistant Visiting Physician to the Presbyterian Hospital, New York City. 12mo of 129 pages. Philadelphia and London: W. B. Saunders Company. Baltimore: The Medical Standard Book Co. Cloth, $1 net. 1913.

This little book will be found a good companion when in doubt as regards what diet to give in this or that condition, as well as how to vary the food so as to make it more acceptable to the patient. It contains schedules of regular house, convalescent, soft, milk and liquid diet, typhoid diets, salt-poor diets, purin-free, gastric, diabetic, anticonstipation, low calcium, diarrhea and obesity diets, gastric test meals, Schmidt's intestinal test meal, table of carbohydrate equivalents, special diabetic recipes, miscellaneous recipes, average chemical composition of American foods, Karell treatment for anasarca, etc., and comments upon each and every diet discussed.

STERILITY IN THE MALE AND FEMALE AND ITS TREATMENT. By Max Huehner, M.D., New York, Chief, Genito-Urinary Department, Harlem Hospital Dispensary, New York City; Formerly Attending Genito-Urinary Surgeon, Bellevue Hospital, Out-patient Department, and Assistant Gynecologist, Mt. Sinai Hospital Dispensary, New York City; Member American Urological Association; Fellow of the New York Academy of Medicine, etc. New York: Rebman Company, Herald Square Building. Cloth, $2 net. 1913.

The above volume embodies the results of many years' work and investigation upon the subject of sterility by the author. The material was obtained from the genito-urinary clinics of the Harlem and Bellevue hospital dispensaries, and from the gynecologic clinic of Mt. Sinai Hospital Dispensary. The investigations extended over a period of six years, and every case of sterility coming into one of the afternoon classes was referred to the author, and ordered to his office at various periods after coitus, thus making it possible to examine various portions of the genital tract, and thereby accurately determine how far the spermatozoa penetrate in normal and pathological cases, the effect on the spermatozoa of various kinds of douches, catarrhal secretions, inflammations, etc. Condom specimens were examined, and experiments made to determine the effect on living spermatozoa of gonococci, prostatic fluid, chemicals, etc. The writer also goes into the clinical histories of the cases in order to determine what effect heredity, stature, age, etc., have upon the production of sterility. As far as we are aware, the work of Huehner is the first scientific and systematic attempt to determine the behavior of spermatozoa after injection into the female genitalia. The writer states, and justly so, that one writer after another has copied into his textbook the so-called findings of his predecessors without challenge or investigation, thereby disseminating a host of erroneous ideas concerning this very important subject. He even goes so far as to state that you cannot draw definite conclusions from the finding of live

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spermatozoa in condom specimens, as regards the sterility or non-sterility factor being the woman. He also says that most operations done on the female for sterility are performed in the dark, no account being taken as to the cause. After a thorough discussion as to the causes of sterility in the sexes, the author outlines his methods of treatment, together with a statement as to why he selects the particular procedure. It is a book well worth while, and if after a thorough investigation the conclusions are proven wrong, will still justify itself in that it calls attention to a subject which authors have been treating in a stereotyped way instead of investigating scientifically for themselves. Much good should evolve from it.

The Career of Dr. Weaver. A Novel. By Mrs. Henry W. Backus. Cloth, decorative; illustrated; 12mo, pp. 373; net, $1.25; postpaid, $1.40. Boston: L. C. Page & Co.

The career of Dr. Weaver is not his alone, nor is it alone the career of the physician who is bidding for wealth and distinction and is oblivious to everything that does not help in his upward climb: it is the type of career which the money-making American of today has carried to such sad excess. Dr. Weaver is a success. He has studied through hardships, seeing always ahead his goal of wealth; after graduation he has started in a modest way, but through studying ways to please women of society has built up a very lucrative practice. Then he founds a hospital, and his idea is that he must "make good" to meet its expenses. His brother, a country practitioner, is called as his assistant, and comes to be his drudge. The younger brother is unknown and is strictly out of the set in which his more prominent brother moves. The younger brother attends the clinics, takes care of the poor and needy, and the older brother goes there only when he can "practice" an operation on some unknown personage before attempting a similar operation on some person whose case will bring him more popularity and wealth. The younger brother, because he is not always able to accept his brother's creed of success, and because he believes in the nobility of his calling, and because he has the deep sympathy of the true physician, is about to break away from the institution owned by his brother, tiring of the hypocrisy of it all, and seeing no change in the future, when the older brother is called to the bedside of the dying Governor. The Governor is delirious and goes back to his younger days when he builded his future on the hearts and souls of those around him, and raves because of his lost happiness. The physician sits there and listens, while the Governor's wife, married to aid in his upward way by her wealth, also hears and thinks "Nellie" was a sister of whom she has never heard, but the physician hears and reads in the ravings a warning.

The story drops here for a few months, and we go back to find Dr. Weaver married to the woman who helped him rise from obscurity to wealth, Dr. Jim working for the cause of progress, and the hospital flourishing. Mrs. Backus has not failed to condemn—through the words of Dr. Jim—the modern evils of fee-splitting, the proprietary hospital, the commercial medical essay, the physician who is not also a good citizen, and the physician who fails to maintain the proper relation between the profession and society. It is a good story, well written, and well worth reading.

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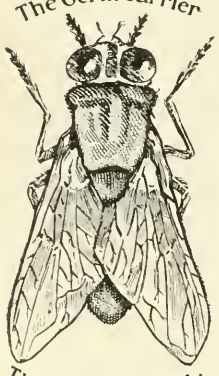

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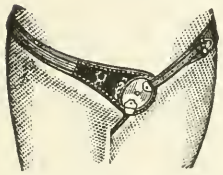

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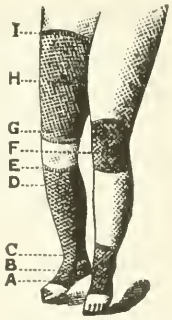

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The difficulty some pupils have in keeping up with their school work is so obviously due to physical deficiency that even parents recognize the disadvantage under which such children labor. These little patients show a listless manner, and only with marked effort do they maintain a creditable standing in their classes. It is in such instances that Cord. Ext. Ol. Morrhuae Comp. (Hagee) has a particular field of usefulness. Being a tissue food in every sense of the word its administration adds a vigor which quickly manifests itself in a large capacity for both physical and mental effort. Cord. Ext. Ol. Morrhuae Comp. (Hagee) enriches the blood stream and brings about an increase in bodily weight. A superior feature of this preparation is its palatability, as a result of which it may be continued over long periods of time without the production of nausea or other annoying consequences.

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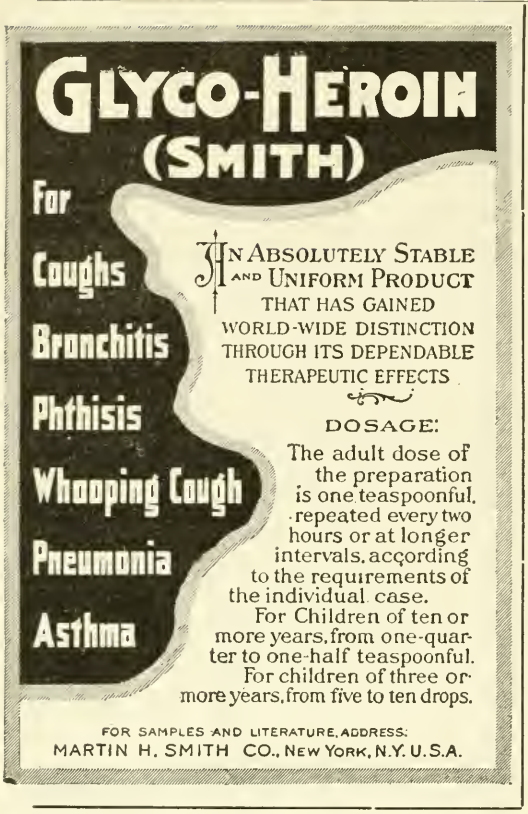
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The Standard Chemical Company is constantly adding to its facilities at the mines and mill, and by practical research methods it is progressing in widening the scope and possibilities of radium and its applications. It has already furnished considerable quantities of radium element to representatives of the medical profession in this country, and it is not difficult to foresee that it will be but a very short time when radium treatment for the cure of cancer, rheumatism, gout and other diseases will become popular here, as these treatments are now in European countries, notably in England, France, Germany and Austria, where a large number of cures have already been effected.

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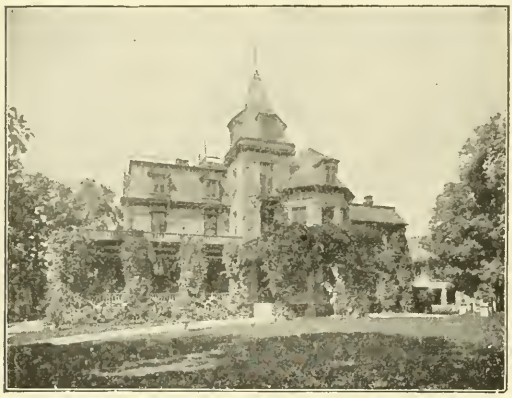

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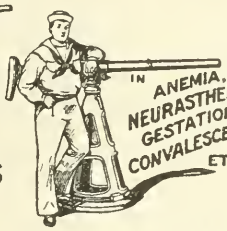

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